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U.S. Patent 5,5,255,309 9

All claims of U.S. Patent No. 5,255,309 are invalid in light of the following prior art:

- The Yankee Group, "Cable and the Telcos: From Confrontation to Détente," Jun. 1983, pp. 162-167;
- Canadian Patent No. 1,162,336 ("DeBruyn");
- U.S. Patent No. 4,755,872 ("Bestler et al."); and
- Emerson, "Voice Response Systems Technology to the Rescue for Business Users." Speech Technology – Jan./Feb. 1983 pp. 99-103.

Accompanying this submission, please find one or more claim charts applying one or more of the above cited prior art references being applied to one or more claims from U.S. Patent No. 5,255,309.

Accompanying this submission, please find a copy of *Ronald A. Katz v. AT&T Corp.*, 63 F.Supp.2d 583 (E.D. Pa. 1999), in which that court construed some elements of patent claims issued to Ronald A. Katz and a copy of *Marlow Indus., Inc. v. Igloo Prod. Corp.*, No. 02-1386, 2003 WL 21212626, (Fed. Cir. May 23, 2003)(unpublished).

Pursuant to 37 U.S.C. §1.555, "each individual associated with the patent owner in a reexamination proceeding has a duty of candor and good faith in dealing with the [Patent] Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability in a reexamination proceeding" (See 37 U.S.C. §1.555 and MPEP 2280)(emphasis added). "Informing the examiner of the pending infringement action is not commensurate with bringing to the examiner's attention the districts court's prior claim construction of the patent or disclosing the court orders embodying this construction. See Rohm & Haas Co. v. Crystal Chem. Co., 722 F.2d 1556, 1572-73, 220 USPQ 289, 302 (Fed. Cir. 1983) (concluding that a presumption that an examiner was able to find, with his expertise and adequate time, the critical data when he was presented with a "mountain of largely irrelevant data" ignores the real world conditions under which examiners work)." Marlow Indus., Inc. v. Igloo Prod. Corp., No. 02-1386, 2003 WL 21212626, at *2-3 (Fed. Cir. May 23, 2003)(unpublished)(See Fed. Cir. Rule 47.6)(emphasis added).

Pursuant to 37 U.S.C. §1.555, we believe that the prior art, decisions, opinions, orders, and arguments associated with the following proceedings may be pertinent:

- West Interactive Corp. v. First Data Resources Inc., 1991 WL 355059 (D. Neb. July 22, 1991);
- First Data Resources Inc. v. West Interactive Corp., No. 91-CV-4471 (C.D. Cal. August 20, 1991);
- West Interactive Corp. v. First Data Resources Inc., 972 F.2d 1295 (Fed. Cir. 1992);
- Ronald A. Katz Tech. Licensing, LP v. AT&T, Corp., No. 97-CV-539 (D. Neb. Oct. 27, 1997);
- Ronald A. Katz Tech. Licensing, LP v. AT&T, Corp., No. 98-CV-88 (D. Neb. Mar. 2, 1998);
- Ronald A. Katz Tech. Licensing, LP v. AT&T Corp., 63 F.Supp.2d 583 (E.D. Pa. 1999);
- Ronald A. Katz Tech. Licensing, LP v. Micro Voice Applications Inc., No. 99-CV-592 (N.D. Cal. Feb. 8, 1999);
- Enhanced Global Convergence Serv., Inc. v. Ronald A. Katz Tech. Licensing, LP, No. 01-CV-375 (D. N.H. Oct. 5, 2001);
- Verizon Cal., Inc. v. Ronald A. Katz Tech. Licensing, LP, No. 01-CV-9871 (C.D. Cal. Nov. 16, 2001);
- Enhanced Global Convergence Serv., Inc. v. Ronald A. Katz Tech. Licensing, LP, No. 02-CV-66 (D. N.H. Feb. 2, 2002);
- Ronald A. Katz Tech. Licensing, LP v. Verizon Communications Inc., 2002 WL 1565483 (E.D. Pa. July 16, 2002);
- Ronald A. Katz Tech. Licensing, LP v. Verizon Communications Inc., 2002 WL 31834833 (E.D. Pa. Dec. 18, 2002); and
- Ronald A. Katz Tech. Licensing, LP v. Verizon Cal., Inc., No. 03-CV-1918 (C.D. Cal. Mar. 18, 2003).

Claim 23: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art – The Yankee Group, "Cable and the Telcos: From Confrontation to Détente," – Jun. 1983, pp. 162-167	The Prior Art – DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984
An analysis control system for use with a communication facility	The article discloses the collaboration between a telephone company and a cable company to provide payper-view services to cable subscribers through the telephone network. "Telcos are already well-equipped to automatically process PPV orders for cable operators." (p. 163).	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25).
	The article discloses a central exchange office, containing a telephone switching system. An example is given where with "30 central exchange offices in Toronto, Bell Canada estimates it can process and transmit PPV orders to five cable headend computers." Exhibit 5-8 discloses <u>a telephone switching system</u> to receive the requests from subscribers (p. 166).	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).
	The <u>central exchange office</u> , not fully depicted in Exhibit 5-8, contains the "telephone switching system" as shown. (p. 166). In Exhibit 5-8, the telephone switching system (located within the central exchange office) is interfaced with the billing system in the cable office. (p. 166). The article discloses a "local private line, permanently installed as a data channel <u>between the telco and cable headend</u> , to forward PPV orders from the telco exchange office computer to cable headend billing and enabling computers." (p. 164).	

Material claim element terms are in **bold**. Corresponding prior art disclosure is <u>underlined</u>.

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including remote	The notice describes the second of the second	
forming controls	The article describes the use of a touch-tone telephone to	DeBruyn discloses a lottery system in which callers can
ter minals for individual	order pay-per-view programming. Specifically, the	access and play a lottery game through a telephone.
callers, wherein each of	article refers to the use of an ordinary touch-tone	"The present invention is concerned with a device for
said remote terminals may	telephone an advantage of the described system. "A key	permitting the use of the telephone for immediately
comprise a conventional	advantage of the Bell Canada/CTRI approach is that it	entering a gambling stake." (p. 1, lines 1-3).
telephone instrument	does not require any new hardware in the home (beyond	
including voice	an addressable converter and dial-up or touch-tone	Fig.1 depicts "one single telephone set 1, which is
communication means and	phone." (p. 167).	connected in the well known manner to the local
digital input means in the		telephone exchange 2." (p. 3. lines 2-3).
form of an array of		
alphabetic numeric buttons		
for providing data, said	In addition, Exhibit 5-8 depicts a simple touch-tone	An example of voice communication is disclosed. In the
analysis control system	telephone at the subscriber's premises connected to the	specification, reply apparatus 8 conveys the following
comprising:	telephone switching system. Specifically, the exhibit	message: "Voll are connected to the central computer of
	depicts a telephone containing a handniege and four rows	the national I ofto After hearing the first signal places
, ,	of hittons, identical to that of a conventional telembone	solog volu first shoon mumbon him one of the
•	or carrons, recurred to that of a convenient telephone.	denies from the chosen number by means of the selector
		device of your telephone set. (p. 4, line 29 through p. 3,
•		IIIIC 3).
		An example of digital communication via the touch-tone
		tolombono in disologod. Instantions one carros to the
		telephone is disclosed. Instructions are given to the
		caller: "After hearing the first signal, please select your
		first chosen number by means of the selector device of
		your telephone set. After each signal you select the
-	• .	following numbers, in arithmetical order." (p. 5, lines 1-
•		4).
an interface structure	The central exchange office contains the hardware and	"In the present case is connected to main exchange 3 a
coupled to said	software disclosed as the "interface structure." It is clear	connection device 5 and a connection device 6, which
communication facility	from the article that the computerized voice response	automatically and respectively connect Dutch speaking
	device is coupled to the ANI system within the central	subscribers to the group for the Dutch language of the
	exchange office. "Every telco central exchange office	computer device and the French speaking subscribers to
	already has installed a computerized voice-response	the group for the French language of the computer
	deviceWhen coupled with their Automatic Number	device." (p. 3, lines 11-16).

	Identification (AMI) exetem telescore are already well	
	equipped to automatically process PPV orders for cable	
	operators." (p. 163).	
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to interface said remote	This allows the central exchange office to transmit ANI	As can be seen in Fig. 1, connection device 5 and
terminals for voice and	information and other information developed at the	connection device 6 both interface the terminals with the
digital communication,	remote terminals to the computerized voice response	lottery system for voice and digital communication.
	<u>device</u> .	Voice communication is demonstrated by the ability of
	The article discloses an ANI system at the local telco	reply apparatus 8 to communicate vocally to the
	central office, along with a computerized voice-response	telephone set 1. "Connection device 5 will switch the
	device. However, in the article discloses as system in	subscriber to the group of Dutch language of the device,
	which major analysis is completed at the cable office.	and the PABX apparatus 7 will set up a connection with
	The article discloses the cable side as having "software	a free line of the reply apparatus 8 which will then, for
:	and microprocessors to handle the incoming order	instance convey the following message: 'You are
	stream, match phone numbers to subscriber addresses,	connected to the central lottery system'" (p. 4, lines
	send authorizations, and record billing information." (p.	25-29).
	164).	
		Digital communication is shown by the ability for a user
	The central exchange office (i.e., a LEC or IXC) is	to enter and reject stakes via his phone. For example:
	clearly capable of interacting with conventional	"Should the telephone subscriber not agree with the
	telephones for the transmission of voice and digital	repeated numbers, he may for instance select the digit U
-	using the disclosed ANI system The article discloses	on his phone selector, (p. 6, lines 11-13).
	that with an ANI system, Bell Canada is capable of	
	"processing orders at the central exchange office level."	
	(p. 163).	
and including means to	The article discloses a "U.S. Approach" whereby	"After the numbers have been selected following each
provide caller data	verification in addition to ANI data is used. In the U.S.	signal, the impulses brought about by the selector device
signais representative of	Approach, a caller enters a "user number" on the	are converted to computer language and stored in

data relating to said individual callers developed by said remote terminals;	telephone keypad to act as additional verification prior to authorization. "The U.S. ANI system requires customers to key in a 'user number,' to verify that their account is paid up, before authorizing the transaction." (p. 167).	memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).
voice generator structure	The central exchange office contains a <u>computerized</u> voice response device. "Every telco central exchange office already has <u>installed a computerized voice-response device</u> ." (p. 163).	Reply Apparatus 8 DeBruyn discloses: "A systemcomprising: at least one reply apparatus, for connection to a telephone exchange
		to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8).
town to the second seco		Another voice generator, conversion and reply apparatus 11 is disclosed by DeBruyn. Conversion and reply apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof"
		(p. 5, lines 24-25).
coupled through said interface structure for actuating said remote	The computerized voice response device is <u>capable of</u> providing vocal instructions, as it "originally was designed to help service personnel be sure they hooked	"Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several
terminals as to provide vocal operating	up newly installed telephones to the correct line and corresponding number." (p. 163). The computerized	telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is
individual callers;	receives and responds to information generated at the remote terminals.	instructions to the telephone subscribers." (p. 3, lines 20-26).
-	In the "U.S. Approach," it is assumed that the <u>voice</u> response computer device prompts the caller to enter a	An example of vocal operating instructions is given: "You are connected to the central computer of the
	בייווט טי ואווט טין ואווט שייי היייוטין יטיוטין שיייין איייין איייין איייין איייין איייין איייין איייין איייין	1 On are confidence to the central compare

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	"user number" for additional identification.	national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set" (p. 4, line 29 through p. 5, line 3).
record structure	The cable office contains a billing system (Exhibit 5-8 p. 166) which comprises "billing and enabling computers." (p. 164). The cable office further contains "software and microprocessors to handle the incoming order stream, match phone numbers to subscriber addresses, send authorizations, and record billing information." (p. 164).	Associated Elements: Memory 9 Extra Memory 10 Scanning Unit 12 Central Computer 4 Auxiliary memory 10
including memory and control means, connected to receive said caller data signals from said interface structure	The billing system receives data signals from the central exchange office over a "local private line, permanently installed as a data channel." (p. 164).	A memory 9 is connected to each telephone line in order to record the selected lotto figures and the subscriber's telephone number. "After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).
for initiating a file and storing digital caller data relating to said individual callers provided from said digital input means through said interface structure; and	The billing system accesses a caller's file based on the digitally received ANI data, matches the ANI data to a particular subscriber, and updates the billing record accordingly. (p. 164).	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8). "The device described above will identify the subscriber
		and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-

Claim 23: U.S. Pat. No. 5,255,309

108, the CODEC 107, the MSS trunk circuit 106, and the MF transmitters 119, one of the CODECs 121, the matrix 4,221,933 (filed December 21, 1978, issued September 9, discloses the use of a processor for "initiating a file" for a associated ESS offices and prepares a customer directory 111 and transmitted to the ESS office 102 via one of the activated customer's line. For example, a customer may stores digital customer data was not a new concept at the "In response to the control signals, the processor 111 of intercepted or transferred to MSS immediately and that "An information message is compiled by the processor The MSS message tells the ESS office how to treat the service has been-requested by a customer of one of the An automated system that initiates customer files and the MSS recognizes that activation of call answering ESS trunk circuit 106, and the ESS trunk circuit 103. accessible via the public telephone network. Cornell The Cornell system can store customer data such as to identify the requesting customer and locations of For example, Cornell et al. United States Patent No. answering service." (Cornell, Col. 4, Lines 11-17). 1980) discloses a central voice messaging system stored signals which relate to the customer's call have the option of requesting phone calls to be time Katz filed his initial disclosure. digital data relating to the caller: customer: 27).

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his phone not be rung or the customer may specify the number of rings to be allowed before a call is intercepted. Service information for each customer of the associated ESS offices is stored in the MSS to utilize the large storage capacity of the MSS and to avoid increasing the storage requirements of the ESS office." (Cornell, Col. 5, Lines 28-42).	DeBruyn discloses a method where a caller can be limited to a certain number of entries a week. "Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the phone number of the subscriber has already been recorded for the current Lotto game. Should this be the case a reply apparatus which is connected to the auxiliary memory 10 will, via this memory, transmit the following message to the subscriber: 'Your stake has been refused, considering you have already entered a previous stake for participation this week'." (p. 5, lines 14-19).	
	In the "U.S. Approach," a "user number" is also required for qualification, prior to authorization of a pay-per-view order. "The U.S. ANI system requires customers to key in a 'user number'," (p. 167). Therefore, the U.S. approach shows how both ANI data received from the communication facility, along with personal identification data (a 'user number') can be recorded and tested. List assumed that the billing computer depicted in Exhibit 5-8 performs the verification and authorization, because the <u>verification is based on information</u> Contained within the billing computer. Specifically, one of the reasons mentioned in the article for denying authorization is an outstanding balance on a caller's account. "To verify their account is paid up, before authorizing the transaction." (p. 167). It is assumed that <u>callers can only purchase a single payper-view event once</u>	- 1
	qualification structure controlled by said record structure for testing caller data signals provided by at least one of said individual callers to specify a consumable participation key for restricting the extent of access to said individual callers to limit data stored for said one of said individual callers on the basis of entitlement.	

Claim 31: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art – DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25).
	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).
including remote terminals for individual callers, wherein each of said remote terminals may	DeBruyn discloses a lottery system in which callers can access and play a lottery game through a <u>telephone</u> . "The present invention is concerned with a device for permitting the use of the <u>telephone</u> for immediately entering a gambling stake." (p. 1, lines 1-3).
comprise a conventional telephone instrument including voice	Fig.1 depicts "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3).
digital input means in the form of an array of alphabetic numeric buttons	An example of <u>voice communication</u> is disclosed. In the specification reply apparatus 8 conveys the following message: " <u>You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set." (p. 4, line 29 through p. 5, line 3).</u>
analysis control system comprising:	An example of digital communication via the touch-tone telephone is disclosed. Instructions are given to the caller: "After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).
an interface structure coupled to said communication facility	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device." (p. 3, lines 11-16).

Material claim element terms are in bold. Corresponding prior art disclosure is underlined.

to interface each of said remote terminals for	As can be seen in Fig. 1, connection device 5 and connection device 6 both interface the terminals with the lottery system for voice and digital communication.
voice and digital	Voice communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1. "Connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: 'You are connected to the central lottery system'" (p. 4, lines 25-29).
	<u>Digital communication</u> is shown by the ability for a user to enter and reject stakes via his phone. For example: "Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his phone selector," (p. 6, lines 11-13).
and including means to provide caller data signals representative of	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).
data relating to said individual callers developed by said remote terminals;	
voice generator structure	Reply Apparatus 8
	DeBruyn discloses: "A systemcomprising: at least one reply apparatus, for connection to a telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8).
	Another voice generator, conversion and reply apparatus 11 is disclosed by DeBruyn. Conversion and reply apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof." (p. 5, lines 24-25).

"Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is connected to the outgoing lines thereof in order to give instructions to the telephone subscribers." (p. 3, lines 20-26). An example of vocal operating instructions is given: "You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set" (p. 4, line 29 through p. 5, line 3).	Memory 9 Extra Memory 10 Scanning Unit 12 Central Computer 4 Auxiliary memory 10	A memory 9 is connected to each telephone line in order to record the selected lotto figures and the subscriber's telephone number. "After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8). "The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27).	An automated system that initiates customer files and stores digital customer data was not a new concept at the time Katz filed his initial disclosure.
coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to each of said individual callers;	record structure	including memory and control means, connected to receive said caller data signals from said interface structure	for initiating a file and storing digital caller data relating to said individual callers provided from said digital input means through said interface structure; and	and the second

	For example, Cornell et al. United States Patent No. 4,221,933 (filed December 21, 1978, issued September 9, 1980) discloses a central voice messaging system accessible via the public telephone network. Cornell discloses the use of a processor for "initiating a file" for a customer:
	"In response to the control signals, the processor 111 of the MSS recognizes that activation of call answering service has been requested by a customer of one of the associated ESS offices and prepares a customer directory to identify the requesting customer and locations of stored signals which relate to the customer's call answering service." (Cornell, Col. 4, Lines 11-17).
	The Cornell system can store customer data such as digital data relating to the caller:
	"An information message is compiled by the processor 111 and transmitted to the ESS office 102 via one of the MF transmitters 119, one of the CODECs 121, the matrix 108, the CODEC 107, the MSS trunk circuit 106, and the ESS trunk circuit 103. The MSS message tells the ESS office how to treat the activated customer's line. For example, a customer may have the option of requesting phone calls to be intercepted or
	transferred to MSS immediately and that his phone not be rung or the customer may specify the number of rings to be allowed before a call is intercepted. Service information for each customer of the associated ESS offices is stored in the MSS to utilize the large storage capacity of the MSS and to avoid increasing the storage requirements of the ESS office." (Cornell, Col. 5, Lines 28-42).
designation structure	DeBruyn discloses generating a stake or cost associated with each caller based on the caller's entered numbers.
structure and said record structure for developing individual designations	"The charges for the stakes can be determined in accordance with the number of selected figures, and in order to avoid abnormally high stakes, a maximum amount can be preset" (p. 5, lines 17-20).
for said individual callers, indicative of caller significance,	
and storing said designations in said record structure.	"The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27).

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As a result, the

Creation and storage of designation numbers by an automated system was not a new concept at the time Katz filed his initial disclosure.

For example, Hennessy et al. United States Patent No. 4,390,968 (filed December 30, 1980, issued June 28, 1983), discloses an automated bank transaction system with various security features. The Hennessy system creates and stores a unique designation number for a customer each time the customer accesses the system:

request (TREQ), and a transaction number (TRAN 1). The TEC thereafter forwards the TREQ, ACCN, TRAN 1 and "At the conclusion of the keyboard entries, the TEC [teller expansion controller] logically generates a transaction transaction limitation data to the central computer 10 by way of the ITC 12." (Hennessy, Col. 5, Lines 60-65).

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Claim 32: U.S. Pat. No. 5,255,309

; "	Claim Elements	The Prior Art - The Yankee Group, "Cable and the Telcos: From Confrontation to Détente," - Jun. 1983, pp. 162-167	The Prior Art - DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984
	An analysis control system for use with a communication facility	The article discloses the collaboration between a telephone company and a cable company to provide payper-view services to cable subscribers through the telephone network. "Telcos are already well-equipped to automatically process PPV orders for cable operators." (p. 163).	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a telephone exchange to which a subscribers' telephone is connected." (p. 1, lines 23-25).
,		The article discloses a central exchange office, containing a telephone switching system. An example is given where with "30 central exchange offices in Toronto, Bell Canada estimates it can process and transmit PPV orders to five cable headend computers." Exhibit 5-8 discloses <u>a telephone switching system</u> to receive the requests from subscribers (p. 166).	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).
. 4		The central exchange office, not fully depicted in Exhibit 5-8, contains the "telephone switching system" as shown. (p. 166).	
		In Exhibit 5-8, the telephone switching system (located within the central exchange office) is interfaced with the billing system in the cable office. (p. 166). The article discloses a "local private line, permanently installed as a data channel between the telco and cable headend, to forward PPV orders from the telco exchange office computer to cable headend billing and enabling computers." (p. 164).	

Material claim element terms are in **bold**. Corresponding prior art disclosure is <u>underlined</u>.

Claim 32: U.S. Pat. No. 5,255,309

alphabetic numeric buttons communication means and said remote terminals may digital input means in the terminals for individual comprise a conventional callers, wherein each of telephone instrument form of an array of for providing data, including remote including voice

The article describes the use of a touch-tone telephone to does not require any new hardware in the home (beyond telephone an advantage of the described system. "A key advantage of the Bell Canada/CTRI approach is that it order pay-per-view programming. Specifically, the an addressable converter and dial-up or touch-tone article refers to the use of an ordinary touch-tone phone." (p. 167)

depicts a telephone containing a handpiece and four rows of buttons, identical to that of a conventional telephone. telephone at the subscriber's premises connected to the telephone switching system. Specifically, the exhibit In addition, Exhibit 5-8 depicts a simple touch-tone

"processing orders at the central exchange office level." using the disclosed ANI system. The article discloses communication, including transmission of ANI data that with an ANI system, Bell Canada is capable of telephones for the transmission of voice and digital The central exchange office (i.e., a LEC or IXC) is clearly capable of interacting with conventional

communication facility has

and wherein said

provide terminal digital

data, for example,

a capability (ANI) to

DeBruyn discloses a lottery system in which callers can "The present invention is concerned with a device for permitting the use of the telephone for immediately access and play a lottery game through a telephone. entering a gambling stake." (p. 1, lines 1-3)

Fig.1 depicts "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3).

device of your telephone set." (p. 4, line 29 through p. 5, An example of voice communication is disclosed. In the select your first chosen number by means of the selector message: "You are connected to the central computer of the national Lotto. After hearing the first signal, please specification, reply apparatus 8 conveys the following

means of the selector device of your telephone set. After Instructions are given to the caller: "After hearing the first signal, please select your first chosen number by each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4)

The communication facility is capable of providing calling number data to the system: "If we presume that the subscriber number is a telephone subscriber, the connection device 5 will switch the subscriber to the group of Dutch language of the number which is attributed to a Dutch speaking <u>device</u>..." (p. 4, lines 23-26).

(p. 163).

control system comprising:

number, said analysis

indicating calling

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,	The ANI system provides signals representative of caller identity to the cable office's billing system, and receives	
	ANI data from the remote terminals at the central exchange office. As seen in Exhibit 5.8 (p. 166), the Telephone Switching System, located at the central exchange office, receives data from the remote terminals, and sends data across a data link to the cable office's billing system.	
an interface structure coupled to said communication facility	The central exchange office contains the hardware and software disclosed as the "interface structure." It is clear from the article that the computerized voice response device is coupled to the <u>ANI system</u> within the central exchange office. "Every telco central exchange office.	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscriber to
an Stage of the St	already has installed a computerized voice-response deviceWhen coupled with their Automatic Number Identification (ANI) system telcos are already wellequipped to automatically process PPV orders for cable operators." (p. 163).	the group for the French language of the computer device." (p. 3, lines 11-16).
to interface each of said remote terminals for voice and digital communication,	The central exchange office (i.e., a LEC or IXC) is clearly capable of interacting with conventional telephones for the transmission of voice and digital communication, including transmission of ANI data	As can be seen in Fig. 1, connection device 5 and connection device 6 both interface the terminals with the lottery system for voice and digital communication.
	using the disclosed ANI system. The article discloses that with an ANI system, Bell Canada is capable of "processing orders at the central exchange office level."	Voice communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1. "Connection device 5 will switch the
		subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for
		instance convey the following message: 'You are connected to the central lottery system'" (p. 4, lines 25-29).
	(

Digital communication is shown by the ability for a user to enter and reject stakes via his phone. For example: "Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his phone selector," (p. 6, lines 11-13). "After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).	DeBruyn discloses the interface as providing caller number. "After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the son prior to subscriber's number" (p. 6, lines 4-7). subscriber's number" (p. 6, lines 4-7).	ne. en the telco	e cable <u>er</u>	terizedReply Apparatus 8xchangeDeBruyn discloses: "A systemcomprising: at least oneice-reply apparatus, for connection to a telephone exchange
	The article discloses a "U.S. Approach" whereby verification in addition to ANI data is used. In the U.S. Approach, a <u>caller enters a 'user number' on the telephone keypad</u> to act as additional verification prior to authorization. "The U.S. ANI system requires customers to key in a "user number," to verify that their account is paid up, before authorizing the transaction." (p. 167).	Further, the article discloses a "local private line, permanently installed as a data channel between the telco office and cable headend." (p. 164).	This line allows ANI data to be received by the cable company to "match phone number to subscriber addresses." (p. 164).	The central exchange office contains a <u>computerized</u> voice response device. "Every telco central exchange office already has <u>installed a computerized voice-response device."</u> (p. 163).
	and including means to provide caller data signals representative of data developed by said remote terminals	and terminal digital data indicative of the calling number using said capability;		voice generator structure

		to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8).
		Another voice generator, conversion and reply apparatus 11 is disclosed by DeBruyn. Conversion and reply apparatus apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof." (p. 5, lines 24-25).
coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to each of said individual callers;	The computerized voice response device is <u>capable of</u> <u>providing vocal instructions</u> , as it "originally was designed to help service personnel be sure they hooked up newly installed telephones to the correct line and corresponding number." (p. 163). The computerized voice response device is <u>coupled to the ANI system</u> , and receives and responds to information generated at the remote terminals.	"Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is connected to the outgoing lines thereof in order to give instructions to the telephone subscribers." (p. 3, lines 20-26).
	In the "U.S. Approach," it is assumed that the <u>voice</u> response computer device prompts the caller to enter a "user number" for additional identification.	An example of vocal operating instructions is given: "You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set" (p. 4, line 29 through p. 5, line 3).
record structure	The cable office contains a billing system (Exhibit 5-8 p. 166) which comprises "billing and enabling computers." (p. 164). The cable office further contains "software and microprocessors to handle the incoming order stream, match phone numbers to subscriber addresses, send authorizations, and record billing information." (p. 164).	Associated Elements: Memory 9 Extra Memory 10 Scanning Unit 12 Central Computer 4 Auxiliary memory 10

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A memory 9 is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number. "After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8). "The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27). An automated system that initiates customer files and stores digital customer data was not a new concept at the time Katz filed his initial disclosure. For example, Cornell et al. United States Patent No. 4,221,933 (filed December 21, 1978, issued September 9, 1980) discloses a central voice messaging system accessible via the public telephone network. Cornell discloses the use of a processor for "initiating a file" for a customer:	"In response to the control signals, the processor 111 of the MSS recognizes that activation of call answering
A mem to record to record telepho "After to signal, are con memor	"After the transmitte subscribed the scann which all which all and charg usual tele Lotto figure?" An autom stores dig time Katz For exam 4,221,933 accessible discloses customer.	"In res the MS
The billing system receives data signals from the central exchange office over a "local private line, permanently installed as a data channel." (p. 164).	The billing system can accesses a caller's file based on the digitally received ANI data, matches the ANI data to a particular subscriber, and updates the billing record accordingly. (p. 164). It is assumed that the billing system can initiate a file for each caller, as it subsequently updates that caller's billing record (p. 164).	
including memory and control means, connected to said interface structure	for initiating a file and storing data relating to certain select ones of said individual callers in accordance with said terminal digital data;	

service has been requested by a customer of one of the associated ESS offices and prepares a customer directory to identify the requesting customer and locations of stored signals which relate to the customer's call answering service." (Cornell, Col. 4, Lines 11-17).	The Cornell system can store customer data such as digital data relating to the caller: "An information message is compiled by the processor	MF transmittent to the ESS office 102 via one of the MF transmitters 119, one of the CODECs 121, the matrix 108, the CODEC 107, the MSS trunk circuit 106, and the ESS trunk circuit 106.	The MSS message tells the ESS office how to treat the activated customer's line. For example, a customer may	have the option of requesting phone calls to be intercepted or transferred to MSS immediately and that	his phone not be rung or the customer may specify the number of rings to be allowed before a call is intercepted.	ESS offices is stored in the MSS to utilize the large	storage capacity of the PSS office." (Cornell, Col. 5 Lines 28-42)		DeBruyn discloses a method where a caller can be limited to a certain number of entries a week.	"Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the phone	number of the subscriber has already been recorded for the current Lotto game. Should this be the case a reply
			e- . s						In the "U.S. Approach," a "user number" is also required for qualification, prior to authorization of a pay-per-view order. "The U.S. ANI system requires customers to key	in a 'user number,' (p. 167). Therefore, the U.S. approach shows how both ANI data received from the	communication facility, along with personal identification data (a 'user number') can be recorded and
		,						~	the	cess to said aid individual	callers; and cc

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apparatus which is connected to the auxiliary memory 10 will, via this memory, transmit the following message to the subscriber: 'Your stake has been refused, considering you have already entered a previous stake for participation this week'." (p. 5, lines 14-19). y, one s, s re	and DeBruyn discloses generating a stake or cost associated with each caller based on the caller's entered numbers. "The charges for the stakes can be determined in accordance with the number of selected figures, and in order to avoid abnormally high stakes, a maximum amount can be preset" (p. 6, lines 17-20).	"(p. and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27).	"As a result, the computer documents will state the phone numbers of the participants, the number and the value of the selected figures and the amount which is charged on the telephone bill." (p. 7, lines 7-10). Creation and storage of designation numbers by an automated system was not a new concept at the time Karz filed his initial disclosure
It is assumed that the billing computer depicted in Exhibit 5-8 performs the verification and authorization, because the verification is based on information contained within the billing computer. Specifically, one of the reasons mentioned in the article for denying authorization is an outstanding balance on a caller's account. "To verify their account is paid up, before authorizing the transaction." (p. 167).	The Yankee Group Report discloses the software and microprocessors as able to "record billing information." (p. 164).	As seen on p. 164, one purpose of the software and microprocessors is to "record billing information." (p. 164).	
	designation structure coupled to said interface structure and said record structure for assigning individual designations to said individual callers,	and storing said designations in said record structure.	Ay and

For example, Hennessy et al. United States Patent No. 4,390,968 (filed December 30, 1980, issued June 28, 1983), discloses an automated bank transaction system with various security features.	The Hennessy system creates and stores a unique designation number for a customer each time the customer accesses the system:	"At the conclusion of the keyboard entries, the TEC Iteller expansion controller logically generates a transaction request (TREQ), and a transaction number (TRAN 1). The TEC thereafter forwards the TREQ, ACCN, TRAN 1 and transaction limitation data to the central computer 10 by way of the ITC 12." (Hennessy, Col. 5, Lines 60-65).
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Claim 33: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art - The Yankee Group, "Cable and the	The Prior Art - DeBruyn Canadian Patent No.	
	pp. 162-167	1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984	
An analysis control system for use with a communication facility	The article discloses the collaboration between a telephone company and a cable company to provide payper-view services to cable subscribers through the telephone network. "Telcos are already well-equipped to automatically process PPV orders for cable operators." (p. 163).	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a telephone exchange to which a subscribers' telephone is connected." (p. 1, lines 23-25).	
	The article discloses a central exchange office, containing a telephone switching system. An example is given where with "30 central exchange offices in Toronto, Bell Canada estimates it can process and transmit PPV orders to five cable headend computers." Exhibit 5-8 discloses <u>a telephone switching system</u> to receive the requests from subscribers (p. 166).	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).	
	The central exchange office, not fully depicted in Exhibit 5-8, contains the "telephone switching system" as shown. (p. 166).		
	In Exhibit 5-8, the telephone switching system (located within the central exchange office) is interfaced with the billing system in the cable office. (p. 166). The article discloses a "local private line, permanently installed as a data channel between the telco and cable headend, to forward PPV orders from the telco exchange office computer to cable headend billing and enabling computers." (p. 164).		- 1
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Material claim element terms are in **bold**. Corresponding prior art disclosure is <u>underlined.</u>

including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument	The article describes the use of a touch-tone telephone to order pay-per-view programming. Specifically, the article refers to the use of an ordinary touch-tone telephone an advantage of the described system. "A key advantage of the Bell Canada/CTRI approach is that it does not require any new hardware in the home (beyond	DeBruyn discloses a lottery system in which callers can access and play a lottery game through a <u>telephone</u> . "The present invention is concerned with a device for permitting the use of the <u>telephone</u> for immediately entering a gambling stake." (p. 1, lines 1-3).
including voice communication means and digital input means in the	an addressable converter and dial-up or touch-tone phone." (p. 167).	Fig.1 depicts "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3).
I form of an array of alphabetic numeric buttons for providing data, said	In addition, Exhibit 5-8 depicts a simple touch-tone	An example of voice communication is disclosed. In the
analysis control system comprising:	telephone at the subscriber's premises connected to the telephone switching system. Specifically, the exhibit depicts a telephone containing a handpiece and four rows	specification reply apparatus 8 conveys the following message: "You are connected to the central computer of the national Lotto. After hearing the first signal, please
	of buttons, identical to that of a conventional telephone.	select your first chosen number by means of the selector device of your telephone set." (p. 4, line 29 through p. 5, line 3).
		An example of digital communication via the touch-tone telephone is disclosed. Instructions are given to the caller: "After hearing the first signal, <u>please select your first chosen number by means of the selector device of</u>
		your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).
an interface structure coupled to said communication facility	The central exchange office contains the hardware and software disclosed as the "interface structure." It is clear from the article that the computerized voice response	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking
	device is coupled to the <u>ANI system</u> within the central exchange office. "Every telco central exchange office	subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to

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Claim 33: U.S. Pat. No. 5,255,309

already has installed a computerized voice-response device...When coupled with their <u>Automatic Number Identification (ANI) system.</u>.. telcos are already well-equipped to automatically process PPV orders for cable operators." (p. 163).

This allows the central exchange office to <u>transmit ANI</u> information and other information developed at the <u>remote terminals to the computerized voice response</u> device.

to interface said remote terminals for voice and digital communication,

The article discloses an ANI system at the local telco central office, along with a computerized voice-response device. However, in the article discloses as system in which major analysis is completed at the cable office. The article discloses the cable side as having "software and microprocessors to handle the incoming order stream, match phone numbers to subscriber addresses, send authorizations, and record billing information." (p. 164)

The central exchange office (i.e., a LEC or IXC) is clearly capable of interacting with conventional telephones for the transmission of voice and digital communication, including transmission of ANI data using the disclosed ANI system. The article discloses that with an ANI system, Bell Canada is capable of "processing orders at the central exchange office level." (p. 163).

the group for the French language of the computer device." (p. 3, lines 11-16).

As can be seen in Fig. 1, <u>connection device 5</u> and <u>connection device 6</u> both interface the terminals with the lottery system for voice and digital communication.

Voice communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1. "Connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: "You are connected to the central lottery system..." (p. 4, lines

Digital communication is shown by the ability for a user to enter and reject stakes via his phone. For example: "Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his phone selector," (p. 6, lines 11-13).

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and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals;	The article discloses a "U.S. Approach" whereby verification in addition to ANI data is used. In the U.S. Approach, a caller enters a "user number" on the telephone keypad to act as additional verification prior to authorization. "The U.S. ANI system requires customers to key in a 'user number,' to verify that their account is paid up, before authorizing the transaction." (p. 167).	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).
record structure	The cable office contains a billing system (Exhibit 5-8 p. 166) which comprises "billing and enabling computers." (p. 164). The cable office further contains "software and microprocessors to handle the incoming order stream, match phone numbers to subscriber addresses, send authorizations, and record billing information." (p. 164).	Associated Elements: Memory 9 Extra Memory 10 Scanning Unit 12 Central Computer 4 Auxiliary memory 10
including memory and control means, connected to receive said caller data signals from said interface	The billing system receives data signals from the central exchange office over a "local private line, permanently installed as a data channel." (p. 164).	<u>A memory 9</u> is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number.
structure		"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).
for initiating a file and storing digital caller data relating to certain select	It is assumed that the billing system can <u>initiate a file</u> , as a caller's file is updated each time an event is ordered:	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the solvered I are
ones of said individual callers	The billing system accesses a caller's file based on the digitally received ANI data, matches the ANI data to a particular subscriber, and updates the billing record accordingly. (p. 164).	which all the information is recorded." (p. 6, lines 4-8). "The device described above will identify the subscriber

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and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27). An automated system that initiates customer files and stores digital customer data was not a new concept at the time Katz filed his initial disclosure.	For example, Cornell et al. United States Patent No. 4,221,933 (filed December 21, 1978, issued September 9, 1980) discloses a central voice messaging system accessible via the public telephone network. Cornell discloses the use of a processor for "initiating a file" for a customer:	"In response to the control signals, the processor 111 of the MSS recognizes that activation of call answering service has been requested by a customer of one of the associated ESS offices and prepares a customer directory to identify the requesting customer and locations of stored signals which relate to the customer's call answering service." (Cornell, Col. 4, Lines 11-17).	The Cornell system can store customer data such as digital data relating to the caller:	"An information message is compiled by the processor 111 and transmitted to the ESS office 102 via one of the MF transmitters 119, one of the CODECs 121, the matrix 108, the CODEC 107, the MSS trunk circuit 106, and the ESS trunk circuit 103. The MSS message tells the ESS office how to treat the
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activated customer's line. For example, a customer may have the option of requesting phone calls to be intercepted or transferred to MSS immediately and that his phone not be rung or the customer may specify the number of rings to be allowed before a call is intercepted. Service information for each customer of the associated ESS offices is stored in the MSS to utilize the large storage capacity of the MSS and to avoid increasing the storage requirements of the ESS office." (Cornell, Col. 5, Lines 28-42).	"A memory 9 is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number." (p. 2, lines 26-28). "After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lott numbers to the scanning unit 12 and to the central computer 4, in which all the information is recorded on computer tape" (p. 6, lines 4-8).	DeBruyn discloses a method where a caller can be limited to a certain number of entries a week. Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the phone number of the subscriber has already been recorded for the current Lotto game. Should this be the case a reply apparatus which is connected to the auxiliary memory 10 will, via this memory, transmit the following message to the subscriber: "Your stake has been refused, considering
	The software microprocessors "Match phone numbers to subscriber addresses, send authorizations, and record billing information." (p. 164).	In one disclosed embodiment, a "user number" is also required for qualification, prior to authorization of a payper-view order. "The U.S. ANI system requires customers to key in a 'user number,' (p. 167). This approach shows how both ANI data received from the communication facility, along with personal identification data (a "user number") can be recorded and tested. It is assumed that the billing computer depicted in
	said record structure including means for recording a telephone identification number for each of said remote terminals as used by each respective one of said individual callers; and	qualification structure controlled by said record structure for testing caller data signals provided by at least one of said individual callers to specify a consumable participation key for restricting the extent of access to said system by said one of said

you have already entered a previous stake for participation this week." (p. 5, lines 14-19).	
Exhibit 5-8 performs the verification and authorization, because the verification is based on information contained within the billing computer. Specifically, one of the reasons mentioned in the article for denying authorization is an outstanding balance on a caller's account. "To verify their account is paid up, before authorizing the transaction." (p. 167).	It is assumed that <u>callers</u> can only purchase a single pay- per-view event once.
individual callers to limit data stored for said one of said individual callers on the basis of entitlement.	

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Claim Elements	ļ —	
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25). "Local telephone exchange 2, which in its turn is in connection with one of the <u>main exchanges 3</u> which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).	
including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument	DeBruyn discloses a lottery system in which callers can access and play a lottery game through a <u>telephone</u> . "The present invention is concerned with a device for permitting the use of the <u>telephone</u> for immediately entering a gambling stake." (p. 1, lines 1-3). Fig.1 depicts "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3).	•
including voice communication means and digital input means in the form of an array of alphabetic numeric buttons	An example of voice communication is disclosed. In the specification reply apparatus 8 conveys the following message: "You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set." (p. 4, line 29 through p. 5, line 3).	
for providing data, said analysis control system comprising:	An example of digital communication via the touch-tone telephone is disclosed. Instructions are given to the caller: "After hearing the first signal, <u>please select your first chosen number by means of the selector device of your telephone set</u> . After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).	
an interface structure coupled to said communication facility	DeBruyn discloses connection device 5, connection device 6: "In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device." (p. 3, lines 11-16).	•

Material claim element terms are in **bold**. Corresponding prior art disclosure is <u>underlined</u>.

to interface each of said remote terminals for voice and digital	As can be seen in Fig. 1, connection device 5 and connection device 6 both interface the terminals with the lottery system for voice and digital communication.
communication,	Voice communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1. "Connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: 'You are connected to the central lottery system'" (p. 4, lines 25-29).
	<u>Digital communication</u> is shown by the ability for a user to enter and reject stakes via his phone. For example: "Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his phone selector," (p. 6, lines 11-13).
and including means to provide answer data signals and identification data signals representative	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).
of data relating to said individual callers developed by said remote terminals;	
voice generator structure	Reply Apparatus 8
	DeBruyn discloses: "A systemcomprising: at least one reply apparatus, for connection to a telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8). Another voice generator, conversion and reply apparatus 11 is disclosed by DeBruyn. Conversion and reply apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof." (p. 5, lines 24-25).

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coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to each of said individual callers; record structure record structure for storing answer data signals and identification data signals for specific individual callers including representations of telephone number of a respective one of said remote terminals used by one of said individual

designation structure	DeBruyn discloses generating a stake or cost associated with each caller based on the caller's entered numbers.
coupled to said interface structure and said record structure for developing individual designations	"The charges for the stakes can be determined in accordance with the number of selected figures, and in order to avoid abnormally high stakes, a maximum amount can be preset" (p. 6, lines 17-20).
and storing said designations in said	"The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27).
record structure; and	"As a result, the computer documents will state the phone numbers of the participants, the number and the value of the selected figures and the amount which is charged on the telephone bill." (p. 7, lines 7-10).
	Creation and storage of designation numbers by an automated system was not a new concept at the time Katz filed his initial disclosure.
	For example, Hennessy et al. United States Patent No. 4,390,968 (filed December 30, 1980, issued June 28, 1983), discloses an automated bank transaction system with various security features.
	The Hennessy system creates and stores a unique designation number for a customer each time the customer accesses the system:
	"At the conclusion of the keyboard entries, the TEC [teller expansion controller] logically generates a transaction request (TREO), and a transaction number (TRAN 1). The TEC thereafter forwards the TREQ, ACCN, TRAN 1 and transaction limitation data to the central computer 10 by way of the ITC 12." (Hennessy, Col. 5, Lines 60-65).
acknowledgement means for confirming caller designations as provided to said individual callers.	DeBruyn discloses confirming the lottery numbers entered by the caller. "When however the stake is accepted, the information of memory 9 is transferred to the conversion and reply apparatus 11, which converts the information to spoken language and informs the telephone subscriber thereof, so that the latter can check whether the correct Lotto numbers have been recorded." (p. 5, lines 22-26).

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Claim 38: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art – DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984	The Prior Art – Bestler et al. U.S. Patent No. 4,755,872 filed Jul. 29, 1985, issued Jul. 5, 1988
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25).	Bestler discloses an Impulse Pay Per View System and Method, the Zenith PHONEVISION system for use with "several central offices in a metropolitan area." (Abstract).
	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).	"As shown, the system comprises a plurality of telephone communication units (TCUs) 20 each located at a corresponding telephone company central office 22." (Col. 5, Lines 51-54).
including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice	DeBruyn discloses a lottery system in which callers can access a system and play a lottery game through a <u>telephone</u> . "The present invention is concerned with a device for permitting the use of the <u>telephone</u> for immediately entering a gambling stake." (p. 1, lines 1-3).	Though remote terminals are not pictured, it is described that in order to access the system, "the cable subscriber would then use his <u>telephone</u> to enter the ANI code and then four or more digits." (Col. 6, Lines 14-16).
communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:	The figure shows "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2" (p. 3, lines 2-3), An example of voice communication is disclosed. In the description, reply apparatus 8 conveys the following message: "You are connected to the central computer of the national Lotto. After hearing the first signal, please	
	select your first chosen number by means of the selector	

Material claim element terms are in **bold**. Corresponding prior art disclosure is <u>underlined</u>.

	device of your telephone set." (p. 4, line 29 through p. 5, line-3).	
	An example of digital communication via the touch-tone phone is disclosed. Instructions are given to the caller: "After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).	
an interface structure coupled to said communication facility	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device." (p. 3, lines 11-16).	Interface Structure: Associated Elements: ANI Computer 24, cable 26, TCU 20, Modem 30, leased telephone lines 32 The interface is coupled to the communication facility to allow remote terminals to access the system. It also allows for information from remote terminals to be delivered to the rest of the system.
to interface each of said remote terminals for voice and digital communication,	Voice Communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1. "Connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: 'You are connected to the central lottery system'" (p. 4, lines 25-29).	The remote terminals call the central office and communicate with the interface. As is known in the art, telephones are capable of voice and digital communication, as are all central offices.
	<u>Digital communication</u> is shown by a user to entering stakes via the telephone. For example: "Should the telephone subscriber not agree with the repeated	

	numbers, he may for instance select the digit 0 on his phone selector," (p. 6, lines 11-13).	
and including means to provide caller data signals representative of data relating to said individual callers developed by said remote	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).	As can be seen in Fig. 1, the TCU is able to send data to the cable headend station via Modems 30 and leased telephone lines 32. "Coupled to each telephone communication unit 20 is a corresponding modem 30. Modems 30 are coupled via leased telephone lines 32 or other communication channels to corresponding modems
terminals;		34 located at cable headend stations 36. Each modem 34 is coupled by a cable 38 to a respective telephone communication controller (TCC) 40." (Col. 5, Line 66 through Col. 6, Line 4).
		Bestler discloses how data is sent from the ANI compute to the TCU: "This data is sent by the ANI computer 24 to its corresponding TCU 20 asynchronously without handshaking, and can be a continual data stream." (Col. 7, Lines 15-17).
		"The nineteen ASCII characters sent by TCU 20 to its TCC 40 are sent via a line using a contracted SDLC protocol." (Col. 8, Lines 28-30).
Voice generator structure	DeBruyn discloses "A systemcomprising: at least one reply apparatus, for connection to a telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8).	

The state of the s

			Associated Elements: System Controller 46 (Control Means) and Billing Computer 50 (Memory):	
Another voice generator, conversion and reply apparatus 11 is disclosed by DeBruyn. Conversion and reply apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof." (p. 5, lines 24-25).	"Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is connected to the outgoing lines thereof in order to give instructions to the telephone subscribers." (p. 3, lines 20-26).	An example of vocal operating instructions is given: "You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set" (p. 4, line 29 through p. 5, line 3).	Associated Elements: Memory 9 Extra Memory 10 Scanning Unit 12 Central Computer 4 Auxiliary memory 10	
	interface structure for actuating said remote terminals as to provide vocal operating instructions to each of said individual callers;	en g	record structure including memory and control means,	nc **

connected to receive said caller data signals from said interface structure for nitiating a file

A memory 9 is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number.

"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6 to 9).

"An important function of each TCC 40 in the preferred embodiment is to convert the ASCII data received from its corresponding TCU 20 into a format more readily usable by the system controller 46." (Col. 10, Lines 31-34).

An automated system that initiates customer files and stores digital customer data was not a new concept at the time Katz filed his initial disclosure.

For example, Cornell et al. United States Patent No. 4,221,933 (filed December 21, 1978, issued September 9, 1980) discloses a central voice messaging system accessible via the public telephone network. Cornell discloses the use of a processor for "initiating a file" for a customer:

"In response to the control signals, the processor 111 of the MSS recognizes that activation of call answering service has been requested by a customer of one of the associated ESS offices and prepares a customer directory to identify the requesting customer and locations of stored signals which relate to the customer's call answering service." (Cornell, Col. 4, Lines 11-17).

The Cornell system can store customer data such as digital data relating to the caller:

"An information message is compiled by the processor 111 and transmitted to the ESS office 102 via one of the MF transmitters 119, one of the CODECs 121, the matrix 108, the CODEC 107, the MSS trunk circuit 106, and the ESS trunk circuit 106, and the ESS trunk circuit 103.

number of rings to be allowed before a call is intercepted. activated customer's line. For example, a customer may Service information for each customer of the associated storage capacity of the MSS and to avoid increasing the intercepted or transferred to MSS immediately and that The MSS message tells the ESS office how to treat the storage requirements of the ESS office." (Cornell, Col. his phone not be rung or the customer may specify the ESS offices is stored in the MSS to utilize the large have the option of requesting phone calls to be

5, Lines 28-42).

The billing computer in conjunction with a database updates files to bill the appropriate subscriber. "System control 46 processes the four sixteen bit words of FIG. 9 to identify the cable subscriber, find the subscriber's decoder address, and change the decoder authorization to allow viewing of the program selected by the subscriber (or to implement a cancellation at the subscriber's request)." (Col. 14, Lines 13-20).

Bestler discloses time-stamping every transaction and storing the transaction. "In addition, from the output 166 information including the converter identification, the program identification, and a timestamp are posted to a disk at 170 within system controller 46." (Col. 15, Lines

"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8).

digital input means through

said interface structure

relating to said individual callers provided from said

and storing digital data

DeBruyn discloses generating a stake associated with each call, and storing this cost in the memory.

including representations

to store designations of said individual callers

indicative of the calling

order sequence of said individual callers; and

"The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27).

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Claim 38: U.S. Pat. No. 5,255,309

qualification structure controlled by said record structure for restricting the extent of access to said system by said individual callers.

DeBruyn discloses a method where a caller can be limited to a certain number of entries a week.

"Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the <u>phone</u> number of the subscriber has already been recorded for the current Lotto game. Should this be the case a reply apparatus which is connected to the auxiliary memory 10 will, via this memory, transmit the following message to the subscriber: "Your stake has been refused, considering you have already entered a previous stake for participation this week." (p. 5, lines 14-19).

Bestler discloses using two forms of qualification. First, the calling number is used to qualify the caller, and ensure that the caller can order a pay-per-view event. Second, part of the dialed is a user-supplied password which is used to further qualify the caller.

"In the event that system control 46 cannot map the telephone number into a converter code (because, for example, of a wrongfully dialed telephone number), an error is generated at 158. That error can also be generated if the data base reflects the unavailability of the event for purchase by that particular subscriber, because of bad credit, tardy bill payments, or whatever reasons are considered to be adequate by the cable company." (Col. 15, Lines 9-17).

"Next, the Z digit may represent a password which is useful for security purposes. For example, within a given household where a cable television system has been installed, parents may, through the use of a password, prevent access by children to certain types of pay per view programming." (Col. 4, Lines 35-40).

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Claim 39: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art – DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25).
	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).
including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument	DeBruyn discloses a lottery system in which callers can access and play a lottery game through a <u>telephone</u> . "The present invention is concerned with a device for permitting the use of the <u>telephone</u> for immediately entering a gambling stake." (p. 1, lines 1-3). Fig.1 depicts "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3).
including voice communication means	An example of <u>voice communication</u> is disclosed. In the specification reply apparatus 8 conveys the following message: "You are connected to the central computer of the national Lotto. After hearing the first signal, <u>please</u>
and digital input means in the form of an array of alphabetic numeric buttons	select your first chosen number by means of the selector device of your telephone set." (p. 4, line 29 through p. 5, line 3).
for providing data, said analysis control system comprising:	An example of digital communication via the touch-tone telephone is disclosed. Instructions are given to the caller: "After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).
an interface structure coupled to said communication facility	DeBruyn discloses connection device 5, connection device 6: "In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device." (p. 3, lines 11-16).

Material claim element terms are in **bold**. Corresponding prior art disclosure is <u>underlined</u>.

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to interface each of said remote terminals for	As can be seen in Fig. 1, <u>connection device 5</u> and <u>connection device 6</u> both interface the terminals with the lottery system for voice and digital communication.
voice and digital communication,	Voice communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1. "Connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: 'You are connected to the central lottery system'" (p. 4, lines 25-29).
	<u>Digital communication</u> is shown by the ability for a user to enter and reject stakes via his phone. For example: "Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his phone selector," (p. 6, lines 11-13).
and including means to provide answer data signals and identification	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).
data signals representative of data relating to said	
developed by said remote terminals;	
voice generator structure	Reply Apparatus 8
	DeBruyn discloses: "A systemcomprising: at least one reply apparatus, for connection to a telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8).
coupled through said interface structure for actuating said remote	Another voice generator, conversion and reply apparatus 11 is disclosed by DeBruyn. Conversion and reply apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof." (p. 5, lines 24-25).
terminais as	

	"Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is connected to the outgoing lines thereof in order to give instructions to the telephone subscribers." (p. 3, lines 20-26).
to provide vocal operating instructions to each of said individual	An example of vocal operating instructions is given: "You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set" (p. 4, line 29 through p. 5, line 3).
callers;	
record structure	Associated Elements: Memory 9 Extra Memory 10
	Scanning Unit 12 Central Computer 4 Auxiliary memory 10
including memory and control means,	A memory 9 is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number.
	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).
	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8).
for storing answer data signals and identification data signals for specific	"The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27). Identifying the subscriber, especially in a Lottery type system might involve verifying the subscriber's age. Storing a

individual callers	birth date in such a system would have been obvious to one skilled in the art well before the time of the earliest Katz filing.
	For example, in 1977, Goldman et al. U. S. RE. 30,579 disclosed a check authorization system that used a birth date as a form of identification (Incidentally, Katz himself is listed as a co-inventor, yet Goldman et al. is not cited against the 5,255,309 patent).
	Goldman reads, "the present invention relates to a data-processing system, and particularly to a system <u>for providing</u> a <u>status report on subjects bearing assigned identification and characteristic identification.</u> " (Goldman, Col. 1, Lines 12-14).
including identification data in the form of each specific individual caller's telephone number and birth date;	In Fig. 1, shown are a "plurality of input units I1 through In. These units are similar and include various push buttons to formulate electrical signals indicative of the characteristic and arbitrary identification relating to a particular subject. The signals from all the input units are applied to a rotary selector 10 which places them in serial form for transmission in sequence into a data-processing system 12." (Goldman, Col. 3, Lines 7-10). "Generally, these units include three distinct sections 16, 18 and 20 which serve to formulate signals respectively
	As another example, consider Gorgens U.S. Patent No. 4,075,460 (filed Nov. 28, 1975). The patent discloses a cash dispensing system that uses a PIN number to identify and authorize a user. "The PIN is typically memorized by the user and may take the form of, for example, his social security number, his birth date or some other personal data known only to the customer and the bank." (Gorgens, Col. 1, Lines 27-30).
	Gorgens describes "the cash dispensing apparatus includes a PIN signal generator, a security device, a PIN signal transfer means, a CIF signal receiving means and a cash dispenser. The PIN signal generator provides a multiple bit PIN signal in response to a manual operation performed by a customer, with the PIN signal being representative of a predetermined multiple bit PIN data word associated with the customer" (Gorgens, Col. 2, Lines 35-43).
designation structure coupled to said interface structure and said record	DeBruyn discloses generating a stake or cost associated with each caller based on the caller's entered numbers. "The charges for the stakes can be determined in accordance with the number of selected figures, and in order to

structure for developing individual designations for said individual callers	avoid abnormally high stakes, a maximum amount can be preset" (p. 6, lines 17-20).
and storing said designations in said record structure.	"The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27).
	"As a result, the computer documents will state the phone numbers of the participants, the number and the value of the selected figures and the amount which is charged on the telephone bill." (p. 7, lines 7-10).
	Creation and storage of designation numbers by an automated system was not a new concept at the time Katz filed his initial disclosure.
	For example, Hennessy et al. United States Patent No. 4,390,968 (filed December 30, 1980, issued June 28, 1983), discloses an automated bank transaction system with various security features.
	The Hennessy system creates and stores a unique designation number for a customer each time the customer accesses the system:
et	"At the conclusion of the keyboard entries, the TEC [teller expansion controller] logically generates a transaction request (TREO), and a transaction number (TRAN 1). The TEC thereafter forwards the TREQ, ACCN, TRAN 1 and transaction limitation data to the central computer 10 by way of the ITC 12." (Hennessy, Col. 5, Lines 60-65).
acknowledgement means for confirming caller designations as provided to said individual callers.	DeBruyn discloses confirming and acknowledging the lottery numbers entered by the caller. "When however the stake is accepted, the information of memory 9 is transferred to the conversion and reply apparatus 11, which converts the information to spoken language and informs the telephone subscriber thereof, so that the latter can check whether the correct Lotto numbers have been recorded." (p. 5, lines 22-26).

Claim 40: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art – DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising: "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25).
	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).
including remote terminals for individual callers, wherein each of	DeBruyn discloses a lottery system in which callers can access a system and play a lottery game through a <u>telephone</u> . "The present invention is concerned with a device for permitting the use of the <u>telephone</u> for immediately entering a gambling stake." (p. 1, lines 1-3).
comprise a conventional telephone instrument	The figure shows "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3).
communication means and digital input means in the form of an array of alphabetic numeric buttons	An example of <u>voice communication</u> is disclosed. In the description, reply apparatus 8 conveys the following message: " <u>You are connected to the central computer of the national Lotto</u> . After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set." (p. 4, line 29 through p. 5, line 3).
tor providing data, said analysis control system comprising:	An example of digital communication via the touch-tone phone is disclosed. Instructions are given to the caller: "After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).
an interface structure coupled to said communication facility	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device." (p. 3, lines 11-16).

Material claim element terms are in bold. Corresponding prior art disclosure is underlined.

voice and digital communication, communication, communication, communication, provide caller data signals representative of data relating to said callers developed by said remote terminals; voice generator structure Reply Apparatus 8 DeBruyn discloses: "A systemcompleter is converibed to computer language and telephone number of the subscriber is clephone is converiber." (p. 1, line 20 through	apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: "You are connected to the central lottery system" (p. 4, lines 25-29). Digital communication is shown by the ability for a user to enter and reject stakes via his phone. For example: "Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his phone selector." (p. 6, lines 11-13). DeBruyn discloses the ability of the system to receive data from remote callers.
	is shown by the ability for a user to enter and reject stakes via his phone. For example: subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his lines 11-13).
	e ability of the system to receive data from remote callers.
1	"After the numbers have been selected following each signal, the impulses brought about by the selector device are
	converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).
DeBruyn discloses: "A systuwing which a subscriber's telephore subscriber." (p. 1, line 20 the	
· 12.	DeBruyn discloses: "A systemcomprising: at least one reply apparatus, for connection to a telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8).
Another voice generator, coapparatus 11 "converts the integration 24-25).	Another voice generator, conversion and reply apparatus 11, is disclosed by DeBruyn. Conversion and reply apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof." (p. 5, lines 24-25).
d or	"Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. \underline{A}
terminals as to provide subscribers." (p. 3, lines 20-26)	subscribers." (p. 3, lines 20-26).

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individual callers;	An example of vocal operating instructions is given: "You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set" (p. 4, line 29 through p. 5, line 3).
record structure	Associated Elements: Memory 9 Extra Memory 10 Scanning Unit 12 Central Computer 4 Auxiliary memory 10
including memory and control means,	A memory 9 is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number. "After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).
for storing answer data signals and identification data signals for specific individual callers including each specific caller's telephone number	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8).
and any of the following: name, address or physical characteristics;	"The device described above will <u>identify the subscriber and charge him</u> the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27).

designation structure coupled to said interface structure and said record structure for developing	DeBruyn discloses generating a stake or cost associated with each caller based on the caller's entered numbers. "The charges for the stakes can be determined in accordance with the number of selected figures, and in order to avoid abnormally high stakes, a maximum amount can be preset" (p. 6, lines 17-20).
individual designations for said individual callers	
and storing said designations in said	"The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6 lines 24-27).
recold structure, and	"As a result, the computer documents will state the phone numbers of the participants, the number and the value of the selected figures and the amount which is charged on the telephone bill." (p. 7, lines 7-10).
	Creation and storage of designation numbers by an automated system was not a new concept at the time Katz filed his initial disclosure.
41	For example, Hennessy et al. United States Patent No. 4,390,968 (filed December 30, 1980, issued June 28, 1983), discloses an automated bank transaction system with various security features.
	The Hennessy system creates and stores a unique designation number for a customer each time the customer accesses the system:
-	"At the conclusion of the keyboard entries, the TEC [teller expansion controller] logically generates a transaction request (TREQ), and a transaction number (TRAN 1). The TEC thereafter forwards the TREQ, ACCN, TRAN 1 and transaction limitation data to the central computer 10 by way of the ITC 12." (Hennessy, Col. 5, Lines 60-65).
acknowledgement means for confirming caller designations as provided to said individual callers.	DeBruyn discloses confirming the lottery numbers entered by the caller. "When however the stake is accepted, the information of memory 9 is transferred to the conversion and reply apparatus 11, which converts the information to spoken language and informs the telephone subscriber thereof, so that the latter can check whether the correct Lotto numbers have been recorded." (p. 5, lines 22-26).

Claim 41: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art – DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25).
	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).
including remote terminals for individual callers, wherein each of said remote terminals may	DeBruyn discloses a lottery system in which callers can access a system and <u>play a lottery game through a telephone</u> . "The present invention is concerned with a device for permitting the use of the <u>telephone for immediately entering a gambling stake</u> ." (p. 1, lines 1-3).
comprise a conventional telephone instrument including voice	Fig. 1 shows "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3).
communication means and digital input means in the form of an array of	"The present invention is concerned with a device for permitting the use of the telephone for immediately entering a gambling stake." (p. 1, lines 1-3).
alphabetic numeric buttons for providing data,	An example of digital communication via the touch-tone phone is disclosed. Instructions are given to the caller: "After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).
	DeBrus discloses a communication facility canable of providing calling number data to the lattery exetem:
communication facility has	Debtuyn discloses a communication tachny capable of providing canning number data to the forcety system.
a capability to provide terminal data, for	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the
example, indicating a	computer device and the French speaking subscribers to the group for the French language of the computer device."
calling number, said analysis control system	(p. 3, lines 11-10).

Material claim element terms are in bold. Corresponding prior art disclosure is underlined.

comprising:	"If we presume that the <u>subscriber number is a telephone number which is attributed to a Dutch speaking subscriber</u> , the connection device 5 will switch the <u>subscriber</u> to the <u>group of Dutch language of the device</u> " (p. 4, lines 23-26).
interface structure coupled to said communication facility	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device." (p. 3, lines 11-16).
ı	As can be seen in the figure, connection device 5 and connection device 6 both interface the terminals and communication facility with the Lottery System for voice and digital communication.
to interface said remote terminals for voice and digital communication,	Voice communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1: "Connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: 'You are connected to the central lottery system' (p. 4, lines 25-29).
	<u>Digital communication</u> is shown by the ability of a user to enter and reject stakes via his phone. For example: "Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his phone selector." (p. 6, lines 11-13).
and including means to	DeBruyn discloses the ability of the system to receive data from remote callers.
provide caller data signals representative of data relating to said individual callers developed by said remote terminals	As depicted in Figure 1, the impulses are sent from the remote terminal (Telephone set 1) through local telephone exchange 2, and main telephone exchange 3. Connection device 5 and connection device 6 interface the lottery system with the main telephone exchange such that the impulses from the main exchange can be transmitted to PABX 7, and memory 9. These impulses include the lottery numbers entered by each individual caller, and the subscriber number automatically provided by the telephone exchanges.
	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the

deal the first land that had been first to the second for the second first to the seco

,	telephone number of the subscriber are recorded." (p. 5, lines 6-11).
and said terminal digital data;	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4" (p. 6, lines 4-8).
analysis structure for processing said caller data signals.	DeBruyn discloses <u>central computer 4</u> to receive caller data signals (i.e. lottery numbers) and process the signals as to bill the callers.
orBrieno)	This processing includes determining charges for the stakes based on the inputted lottery number. The process identifies the subscriber based on the calling number, and updates the subscriber's telephone bill to reflect the charges for the stakes.
vagge in	"The charges for the stakes can be determined in accordance with the number of selected figures, and in order to avoid abnormally high stakes, a maximum amount can be preset which, when exceeded, would be refused by the computer device would also refuse a stake, when for instance figures are selected which do not correspond to the Lotto figures." (p. 6. lines 17-23)
Po ad	
structure for controlling said analysis structure in	"Before the drawing of the winning numbers is started, the magnetic tape of the central computer 4 is sealed and safely stored away. After the drawing, the computer is programmed with the winning numbers and the magnetic tape
accordance with said terminal digital data; and	is then read in at high speed. As a result, the computer documents will state the phone numbers of the participants, the number and the value of the selected figures and the amount which is charged on the telephone bill. The winners of prizes are identified and payed out with a check or bay any other means." (p. 7, lines 3-12).
qualification structure to	DeBruyn discloses a method where a caller can be limited to a certain number of entries a week.
specifying a consumable participation key as	Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the <u>phone number of</u> the subscriber has already been recorded for the current Lotto game. Should this be the case a reply apparatus which
provided from at least one of said remote terminals.	is connected to the auxiliary memory 10 will, via this memory, transmit the following message to the subscriber: "Your stake has been refused, considering you have already entered a previous stake for participation this week." (p. 5, lines 14-19).

Claim 43: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art – DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25).
	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).
including remote terminals for individual callers, wherein each of said remote terminals may	DeBruyn discloses a lottery system in which callers can access a system and play a lottery game through a telephone. "The present invention is concerned with a device for permitting the use of the telephone for immediately entering a gambling stake." (p. 1, lines 1-3).
telephone instrument	
including voice communication means and digital input means	The figure shows "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2" (p. 3, lines 2-3).
in the form of an array of alphabetic numeric buttons for providing data, said	"The present invention is concerned with a device for permitting the use of the telephone for immediately entering a gambling stake." (p. 1, lines 1-3).
analysis control system comprising:	An example of digital communication via the touch-tone phone is disclosed. Instructions are given to the caller: "After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).
an interface structure coupled to said communication facility	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device." (p. 3, lines 11-16).

Material claim element terms are in bold. Corresponding prior art disclosure is underlined.

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to interface said remote terminals for voice and digital communication,	As can be seen in the figure, Connection Device 5 and Connection Device 6 both interface the terminals and communication facility with the Lottery System for voice and digital communication.
	Voice Communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1. "Connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: "You are connected to the central lottery system" (p. 4, lines 25-29).
,	<u>Digital communication</u> is shown by the ability of a user to enter and reject stakes via his phone. For example: "Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his phone selector," (p. 6, lines 11-13).
-	
and including means to provide caller data signals representative of data relating to said individual callers developed by said remote	As depicted in Figure 1, the impulses are sent from the remote terminal (Telephone set 1) through local telephone exchange 2, and main telephone exchange 3. Connection device 5 and connection device 6 interface the lottery system with the main telephone exchange such that the impulses from the main exchange can be transmitted to PABX 7, and memory 9. These impulses include the lottery numbers entered by each individual caller, and the subscriber number automatically provided by the telephone exchanges.
terminals;	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).
voice generator structure	DeBruyn discloses in relevant part: "A systemcomprising: at least one reply apparatus, for connection to a telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8).
coupled through said interface structure for actuating said remote	Described is a system, comprising: "at least one reply apparatus, for connection to a telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, lines 23-26).

terminals as to provide vocal operating instructions to said individual callers;	"Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is connected to the outgoing lines thereof in order to give instructions to the telephone subscribers." (p. 3, lines 20-26).
-	An example of vocal operating instructions is given: "You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set" (p. 4, line 29 through p. 5, line 3).
	Another voice generator, conversion and reply apparatus 11 is disclosed by DeBruyn. Conversion and reply apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof." (p. 5, lines 24-25).
record structure including memory and control means,	Associated Elements: Memory 9 Extra Memory 10 Scanning Unit 12
	Central Computer 4 Auxiliary memory 10
connected to receive said	$\underline{A \text{ memory } 9}$ is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number.
said interface sudding initiating a file	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).
·	An automated system that initiates customer files and stores digital customer data was not a new concept at the time Katz filed his initial disclosure.
	For example, Cornell et al. United States Patent No. 4,221,933 (filed December 21, 1978, issued September 9, 1980) discloses a central voice messaging system accessible via the public telephone network. Cornell discloses the use of

Claim 43: U.S. Pat. No. 5,255,309

a processor for "initiating a file" for a customer:

"In response to the control signals, the processor 111 of the MSS recognizes that activation of call answering service has been requested by a customer of one of the associated ESS offices and prepares a customer directory to identify the requesting customer and locations of stored signals which relate to the customer's call answering service." (Cornell, Col. 4, Lines 11-17).

The Cornell system can store customer data such as digital data relating to the caller:

be allowed before a call is intercepted. Service information for each customer of the associated ESS offices is stored transmitters 119, one of the CODECs 121, the matrix 108, the CODEC 107, the MSS trunk circuit 106, and the ESS "An information message is compiled by the processor 111 and transmitted to the ESS office 102 via one of the MF ransferred to MSS immediately and that his phone not be rung or the customer may specify the number of rings to n the MSS to utilize the large storage capacity of the MSS and to avoid increasing the storage requirements of the runk circuit 106, and the ESS trunk circuit 103. The MSS message tells the ESS office how to treat the activated customer's line. For example, a customer may have the option of requesting phone calls to be intercepted or ESS office." (Cornell, Col. 5, Lines 28-42).

"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8).

and storing caller digital

data relating to said individual callers provided from said digital input means through said

interface structure,

and including identification data in the form of callers' telephone number

As seen above, information recorded includes the subscriber's number. "After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8)

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Claim 44: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art DeBruin Concesson Detroit Me	
	1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984	The Frior Art – Emerson. "Voice Response Systems – Technology to the Rescue for Business Users." Speech Technology – Jan./Feb. 1983 pp. 99-103
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising: "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25).	Emerson discusses Periphonics voice response systems. Emerson describes the Periphonics systems as being able to "handle both voice and data on the same communications lines." (p. 99).
	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).	
including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:	DeBruyn discloses a lottery system in which callers can access a system and play a lottery game through a telephone. "The present invention is concerned with a device for permitting the use of the telephone for immediately entering a gambling stake." (p. 1, lines 1-3). Fig. 1 depicts "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3) An example of voice communication is disclosed. In the description, reply apparatus 8 conveys the following message: "You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector	Emerson discloses that "By treating the telephone as just one of several input devices to a system, voice response enhances the user's operation instead of working as a separate entity." (p. 99). Note Fig. 2 (p. 101) shows "Retail calls special phone number."

Material claim element terms are in **bold**. Corresponding prior art disclosure is <u>underlined</u>.

	device of your telephone set." (p. 4, line 29 through p. 5, line 3).	
	An example of digital communication via the touch-tone phone is disclosed. Instructions are given to the caller: "After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).	
interface structure coupled to said communication facility	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to	The voice response system interfaces with telephone lines from a communication facility: "When a call comes in on a voice response system, the system must be able to determine whether it is a voice or
	the group for the French language of the computer device." (p. 3, lines 11-16).	a data call (voice and data enter on the same set of lines). The system then automatically switches to the appropriate communications mode." (p. 101).
to interface said remote terminals for voice and dioital communication	As can be seen in the figure, Connection Device 5 and Connection Device 6 both interface the terminals and communication facility with the Lottery System for voice	Voice communication: "As illustrated in Fig. 2, <u>a</u> <u>Periphonics system answers the phone and "speaks" a predetermined greeting" (p. 101).</u>
	and digital communication. Voice communication is demonstrated by the ability of	Digital Communication: "The caller responds by way of the Touch-Tone dialer on
	reply apparatus 8 to communicate vocally to the telephone set 1. "connection device 5 will switch the subscriber to the group of Dutch language of the device	his phone." (p. 101). "Once the voice resnonse system identifies the caller and
·	and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for	his needs, it must locate the necessary data base, which is either in its own memory or that of another data system.
	instance convey the following message: "You are connected to the central lottery system" (p. 4, lines 25-	It does so by converting the Touch-Tone inputs into the format of the proper data base." (p. 101).

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and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals; record structure, including memory and control means, connected to receive said caller data signals from said interface surface [sic] for updating a file

	$\underline{\text{memory } 9.7}$ (p. 5, lines 6-9).	
and storing caller data relating to certain select ones of sad individual callers	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8).	Emerson also discloses "confirming, changing and deleting orders." (p. 103).
said record structure including means for recording a credit card identification number provided by a respective one of said individual caller; and		Emerson discloses a credit authorization service. "For credit card authorizations, the system gives the caller an OK, gives the reason for rejection, or transfers the call to a backup operator." (p. 101).
qualification structure controlled by said record structure for testing caller data signals provided by said respective one of said individual callers	DeBruyn discloses a method where a caller can be limited to a certain number of entries a week. "Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the phone number of the subscriber has already been recorded for the current Lotto game. Should this be the case a reply apparatus which is connected to the auxiliary memory 10 will, via this memory, transmit the following message to the subscriber: "Your stake has been refused, considering you have already entered a previous stake for participation this week." (p. 5, lines 14-19).	Emerson discloses a credit authorization service. "For credit card authorizations, the system gives the caller an OK, gives the reason for rejection, or transfers the call to a backup operator." (p. 101).

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Claim 44: U.S. Pat. No. 5,255,309

"Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the phone number of the subscriber has already been recorded for the current Lotto game." (p. 5, lines 11-14).

Claim 45: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art – DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984	The Prior Art – Emerson. "Voice Response Systems – Technology to the Rescue for Business Users." Speech Technology – Jan./Feb. 1983 pp. 99-103
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising: "at least one reply apparatus, for connection to a telephone exchange to which a subscribers' telephone is connected." (p. 1, lines 23-25).	Emerson discusses Periphonics voice response systems. Emerson describes the Periphonics systems as being able to "handle both voice and data on the same communications lines." (p. 99).
	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).	
including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument	DeBruyn discloses a lottery system in which callers can access a system and play a lottery game through a telephone. "The present invention is concerned with a device for permitting the use of the telephone for immediately entering a gambling stake." (p. 1, lines 1-3).	Emerson discloses that "By treating the telephone as just one of several input devices to a system, voice response enhances the user's operation instead of working as a separate entity." (p. 99). Note Fig. 2 (p. 101) shows "Retail calls special phone number."
including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:	Fig. 1 depicts "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3) An example of voice communication is disclosed. In the description, reply apparatus 8 conveys the following message: "You are connected to the central computer of the national Lotto. After hearing the first signal, please	

Material claim element terms are in **bold**. Corresponding prior art disclosure is <u>underlined</u>.

	select your first chosen number by means of the selector device of your telephone set." (p. 4, line 29 through p. 5, line 3).	
	An example of digital communication via the touch-tone phone is disclosed. Instructions are given to the caller: "After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).	
interface structure coupled to said communication facility	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device and the French language of the computer device." (p. 3, lines 11-16).	The voice response system interfaces with telephone lines from a communication facility: "When a call comes in on a voice response system, the system must be able to determine whether it is a voice or a data call (voice and data enter on the same set of lines). The system then automatically switches to the appropriate communications mode." (p. 101).
to interface said remote terminals for voice and digital communication,	As can be seen in the figure, Connection Device 5 and Connection Device 6 both interface the terminals and communication facility with the Lottery System for voice and digital communication.	Voice communication: "As illustrated in Fig. 2, a Periphonics system answers the phone and "speaks" a predetermined greeting" (p. 101).
	Voice communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1. "connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with	Digital Communication: "The caller responds by way of the Touch-Tone dialer on his phone." (p. 101). "Once the voice response system identifies the caller and

Claim 45: U.S. Pat. No. 5,255,309

and including means to provide caller data and including to caller data signals representative of an are entre or the relephone numbers of the signal computer language and stored in dividual callers and including to said and including to said	his needs, it must locate the necessary data base, which is either in its own memory or that of another data system. It does so by converting the Touch-Tone inputs into the format of the proper data base." (p. 101). r r e. e.
remote recorded." (p. 5, lines 6-11). ncluding Memory 9 Extra Memory 10 Scanning Unit 12 Central Computer 4 Auxiliary memory 10	"The system then accesses memory in a manner similar to that used by a standard computer terminal." (p. 101).

criber's order taking. He discloses the system as being able to "accept orders" (p. 103). Taking an order would involve updating a file for a customer. g each or device din	<u>pulse is</u> Emerson also discloses " <u>confirming, changing and deleting orders</u> ." (p. 103). <u>lbers to r 4 in tes 4 in tes 4 in tes 4-8</u>).	Emerson discloses a <u>credit authorization service</u> . " <u>For credit card authorizations</u> ; the system gives the caller an OK, gives the reason for rejection, or transfers the call to a backup operator." (p. 101).	be Emerson discloses a credit authorization service. "For credit card authorizations, the system gives the caller an OK, gives the reason for rejection, or transfers the call to a backup operator." (p. 101).
A memory 9 is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number. "After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8).		DeBruyn discloses a method where a caller can be limited to a certain number of entries a week. "Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the phone number of the subscriber has already been recorded for
connected to receive said caller data signals from said interface structure for initiating a file	and storing caller data relating to certain select ones of sad individual callers	said record structure including means for recording a credit card identification number provided by a respective one of said individual caller; and	qualification structure controlled by said record structure for testing caller data signals provided by said respective one of said individual callers

Claim 45: U.S. Pat. No. 5,255,309

	apparatus which is connected to the auxiliary memory 10
	will, via this memory, transmit the following message to
	the subscriber: "Your stake has been refused, considering
-	you have already entered a previous stake for
	participation this week." (p. 5, lines 14-19).

"Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the <u>phone</u> number of the <u>subscriber has already been recorded for the current Lotto game</u>." (p. 5, lines 11-14).

to specify a consumable

participation key for

restricting the extent of access to said system to

limit data stored for said

individual callers on the

basis of entitlement.

respective one of said

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Claim 46: U.S. Pat. No. 5,255,309

	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a telephone o exchange to which a subscribers' telephone is connected." (p. 1, lines 23-25).	"Local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).	n.	ති <i>ය</i>	
The Prior Art – The Yankee Group, "Cable and the Telcos: From Confrontation to Détente," – Jun. 1983, pp. 162-167	The article discloses the collaboration between a telephone company and a cable company to provide payper-view services to cable subscribers through the telephone network. "Telcos are already well-equipped to automatically process PPV orders for cable operators." (p. 163).	The article discloses a central exchange office, containing a telephone switching system. An example is given where with "30 central exchange offices in Toronto, Bell Canada estimates it can process and transmit PPV orders to five cable headend computers." Exhibit 5-8 discloses <u>a telephone switching system</u> to receive the requests from subscribers (p. 166).	The central exchange office, not fully depicted in Exhibit 5-8, contains the "telephone switching system" as shown. (p. 166).		forward PPV orders from the telco exchange office computer to cable headend billing and enabling computers." (p. 164).
Claim Elements	An control system for use with a communication facility				

Material claim element terms are in **bold**. Corresponding prior art disclosure is <u>underlined</u>.

							*
DeBruyn discloses a lottery system in which callers can access a system and play a lottery game through a telephone. "The present invention is concerned with a device for permitting the use of the telephone for immediately entering a gambling stake." (p. 1, lines 1-3).	the figure snows one snigle telephone set 1, which is connected in the well known manner to the local telephone exchange 2" (p. 3, lines 2-3).	An example of voice communication is disclosed. In the description, reply apparatus 8 conveys the following message: "You are connected to the central computer of	the national Lotto. After hearing the first signar, prease select your first chosen number by means of the selector device of your telephone set." (p. 4, line 29 through p. 5, line 3).	An example of digital communication via the touch-tone phone is disclosed. Instructions are given to the caller: "After hearing the first signal, please select your first	chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which	subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device." (n. 3 lines 11-16)
The article describes the use of a touch-tone telephone to order pay-per-view programming. Specifically, the article refers to the use of an ordinary touch-tone telephone an advantage of the described system. "A key advantage of the Bell Canada/CTRI approach is that it does not require any new hardware in the home (beyond an addressable converter and dial-up or touch-tone	<u>phone.</u> " (p. 167).	In addition, Exhibit 5-8 depicts a <u>simple touch-tone</u> <u>telephone</u> at the <u>subscriber's premises</u> connected to the telephone switching system. Specifically, the <u>exhibit</u>	depicts a telephone containing a handpiece and tour rows of buttons, identical to that of a conventional telephone.			The central exchange office contains the hardware and software disclosed as the "interface structure." It is clear	device is coupled to the <u>ANI system</u> within the central exchange office. "Every telco central exchange office already has installed a computerized voice-response
including remote callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice	communication means and digital input means in the form of an array of alphabetic numeric buttons	for providing data, said control system comprising:				an interface structure coupled to said	communication facility

	<u>Identification (ANI) system</u> telcos are already well- equipped to automatically process PPV orders for cable operators." (p. 163).	
to interface said remote terminals for voice and	This allows the central exchange office to <u>transmit ANI</u> information and other information developed at the	Voice communication is demonstrated by the ability of reply apparatus 8 to communicate vocally to the
digital communication,	remote terminals to the computerized voice response device.	telephone set 1. "connection device 5 will switch the
	E	and the PABX apparatus 7 will set up a connection with
	I he article discloses an ANI system at the local telco central office, along with a computerized voice-response	a free line of the reply apparatus 8 which will then, for instance convey the following message: "Von are
	device. However, in the article discloses as system in	connected to the central lottery system" (p. 4, lines 25-
,	The article discloses the cable side as having "software	29).
-	and microprocessors to handle the incoming order	Digital communication is shown by the ability for a user
	send authorizations, and record billing information." (p.	to enter and reject stakes via his phone. For example:
	164).	repeated numbers, he may for instance select the digit 0
	The central exchange office (i.e., a LEC or IXC) is	on his phone selector," (p. 6, lines 11-13).
	clearly capable of interacting with conventional	DeBruyn discloses the ability of the system to receive
	communication including transmission of AMI 4445	data from remote callers.
	using the disclosed ANI system. The article discloses	
	that with an ANI system, Bell Canada is capable of	,
	(p. 163).	
and including means to	The article discloses a "U.S. Approach" whereby	"After the numbers have been selected following each
signals representative of	Approach, a caller enters a	signal, the impulses brought about by the selector device are converted to committee language and stored in
		The same and selection and sel

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data relating to said individual callers developed by said remote terminals; au voice generator structure voice generator structure tinterface structure for actuating said remote terminals as to provide vocal operating instructions to said instructions to said individual callers; r	ANI system requires customers to key in a 'user number', to verify that their account is paid up, before authorizing the transaction." (p. 167). The central exchange office contains a computerized voice response device. "Every telco central exchange office already has installed a computerized voice-response device." (p. 163). The computerized voice response device is capable of providing vocal instructions, as it "originally was designed to help service personnel be sure they hooked up newly installed telephones to the correct line and corresponding number." (p. 163). The computerized voice response device is coupled to the ANI system, and receives and responds to information generated at the remote terminals. In the "U.S. Approach," it is assumed that the voice response computer device prompts the caller to enter a 'user number' for additional identification.	memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11). DeBruyn discloses "A systemcomprising: at least one reply apparatus, for connection to a telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8). Another voice generator, conversion and reply apparatus 11, is disclosed by DeBruyn. Conversion and reply apparatus 11, is disclosed by DeBruyn. Conversion and reply apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof." (p. 5, lines 24-25). "Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is connected to the outgoing lines thereof in order to give instructions to the telephone subscribers." (p. 3, lines 20-26). An example of vocal operating instructions is given: "You are connected to the central computer of the national Lotto. After hearing the first signal, please national Lotto. After hearing the first signal, please selector vour first chosen number by means of the selector
		device of your telephone set" (p. 4, line 29 through p.

record structure	The cable office contains a billing augton (F. 1.31.36 o	
	166) which comprises "billing and enabling computers." (p. 164). The cable office further contains "software and microprocessors to handle the incoming order stream, match phone numbers to subscriber addresses, send authorizations, and record billing information." (p. 164).	Associated Elements: Memory 9 Extra Memory 10 Scanning Unit 12 Central Computer 4 Auxiliary memory 10
including memory and control means, connected to receive said caller data signals from said interface	The billing system receives data signals from the central exchange office over a " <u>local private line</u> , permanently installed as a data channel." (p. 164).	A memory 9 is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number.
structure		"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).
for updating a file and storing digital caller data relating to said individual callers provided from said digital input means through said interface structure; and	The billing system accesses a caller's file based on the digitally received ANI data, matches the ANI data to a particular subscriber, and updates the billing record accordingly. (p. 164).	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8).
		"The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27).
qualification structure controlled by said record structure for testing caller	In the "U.S. Approach," a "user number" is also required for qualification, prior to authorization of a pay-per-view order. "The U.S. ANI system requires customers to key	DeBruyn discloses a method where a caller can be limited to a certain number of entries a week.

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Claim 46: U.S. Pat. No. 5,255,309

data signals provided by a respective one of said individual callers to specify a consumable participation key for restricting the extent of access to said system to limit data stored from said respective one of said individual callers on the basis of entitlement.

in a 'user number', (p. 167). Therefore, the U.S. approach shows how both ANI data received from the communication facility, along with personal identification data (a "user number") can be recorded and tested.

It is assumed that the billing computer depicted in Exhibit 5-8 performs the verification and authorization, because the verification is based on information contained within the billing computer. Specifically, one of the reasons mentioned in the article for denying authorization is an outstanding balance on a caller's account. "To verify their account is paid up, before authorizing the transaction." (p. 167).

It is assumed that <u>callers can only purchase a single pay-</u> per-view event once.

Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the phone number of the subscriber has already been recorded for the current Lotto game. Should this be the case a reply apparatus which is connected to the auxiliary memory 10 will, via this memory, transmit the following message to the subscriber: "Your stake has been refused, considering you have already entered a previous stake for participation this week." (p. 5, lines 14-19).

As each time a user enters into the Lotto stake, data must be stored, such a participation key limits the amount of storage for a user depending on whether he has played the current game.

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Claim 53: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art - DeBruyn Canadian Patent No. 1,162,336 filed Jan. 8, 1981, issued Feb. 14, 1984
An analysis control system for use with a communication facility	DeBruyn discloses a system that allows a user to enter a lottery stake via a telephone, a system comprising "at least one reply apparatus, for connection to a <u>telephone exchange</u> to which a subscribers' telephone is connected." (p. 1, lines 23-25). "Local telephone exchange 2, which in its turn is in connection with one of the <u>main exchanges 3</u> which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter." (p. 3, lines 3-7).
including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument	DeBruyn discloses a lottery system in which callers can access a system and <u>play a lottery game through a telephone</u> . "The present invention is concerned with a device for <u>permitting the use of the telephone for immediately entering a gambling stake</u> ." (p. 1, lines 1-3). The figure shows "one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2." (p. 3, lines 2-3).
communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:	"The present invention is concerned with a device for permitting the use of the telephone for immediately entering a gambling stake." (p. 1, lines 1-3). "After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).

Material claim element terms are in bold. Corresponding prior art disclosure is underlined.

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an interface structure coupled to said communication facility	"In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the computer device and the French speaking subscribers to the group for the French language of the computer device." (p. 3, lines 11-16).
to interface said remote terminals for voice and digital communication,	As depicted in Fig. 1, <u>connection Device 5</u> and <u>connection device 6</u> both interface the terminals and communication facility with the Lottery System for voice and digital communication. <u>Voice communication</u> is demonstrated by the ability of reply apparatus 8 to communicate vocally to the telephone set 1. "Connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PARX
	apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: "You are connected to the central lottery system" (p. 4, lines 25-29).
	<u>Digital communication</u> is shown by the ability for a user to enter and reject stakes via his phone. For example: "Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit 0 on his phone selector." (p. 6, lines 11-13).
	"After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order." (p. 5, lines 1-4).
and including means to	As depicted in Figure 1, the impulses are sent from the remote terminal (Telephone set 1) through local telephone exchange 2. Competing devices 6 and competing devices 4 interested the lettern
signals representative of data relating to said individual callers	system with the main telephone exchange 3. Connection device 5 and connection device 6 interface the follery system with the main telephone exchange such that the impulses from the main exchange can be transmitted to PABX 7, and memory 9. These impulses include the lottery numbers entered by each individual caller, and the subscriber number automatically provided by the telephone exchanges.
developed by said remote terminals;	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other words, the selected Lotto numbers and the telephone number of the subscriber are recorded." (p. 5, lines 6-11).
voice generator structure	DeBruyn discloses in relevant part: "A systemcomprising: at least one reply apparatus, for connection to a

	telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber." (p. 1, line 20 through p. 2, line 8).
	"Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is connected to the outgoing lines thereof in order to give instructions to the telephone subscribers." (p. 3, lines 20-26).
coupled through said interface structure for actuating said remote	Another voice generator, conversion and reply apparatus 11 is disclosed by DeBruyn. Conversion and reply apparatus 11 "converts the information to spoken language and informs the telephone subscriber thereof." (p. 5, lines 24-25).
vocal operating instructions to said individual callers;	"Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is connected to the outgoing lines thereof in order to give instructions to the telephone subscribers." (p. 3, lines 20-26).
	"You are connected to the central computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set" (p. 4, line 29 through p. 5, line 3).
record structure	Associated Elements: Memory 9 Extra Memory 10
	Scanning Unit 12 Central Computer 4 Auxiliary memory 10
	of the first of th
including memory and control means, connected	A memory 9 is connected to each telephone line in order to record the selected Lotto figures and the subscriber stelephone number.
to receive said caller data	

signals from said interface structure	"After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to a computer language and stored in memory 9." (p. 5, lines 6-9).
	"After the receiver has been hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4 in which all the information is recorded." (p. 6, lines 4-8).
for addressing a file, to store digital data relating to said individual callers,	"The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake." (p. 6, lines 24-27).
said data including consumable participation key data based on entitlement	As seen in the analysis of the qualification structure, the subscriber number which is recorded is used as a consumable key. "Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the phone number of the subscriber has already been recorded for the current Lotto game." (p. 5, lines 11-14). As seen above, the subscriber number is recorded in central computer 4. (p. 6, lines 4-8).
and credit card number data for a respective one of said individual callers provided from said digital	The storing of credit card numbers was well known in the art before the initial Katz filing. For example, consider an article by Emerson, S. Thomas, entitled "Voice Response Systems – Technology to the Rescue for Business Users." (Speech Technology Jan/Feb. 1983).
input means through said interface structure,	The article describes the state of the art of Periphonics VRU's. Also described are a variety of applications using VRU's. One such application was for <u>credit card authorization</u> . (Emerson, p. 100). "Periphonics installed the voice response credit card authorization system shown in Fig. 2 for the oil company in the fall of 1981." (Emerson, p. 103).
and to store designations of said individual callers including representations	DeBruyn discloses storing stakes for each caller associated with cost. "The charges for the stakes can be determined in accordance with the number of selected figures." (p. 6, lines 17-19).

"The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected lotto figures and the cost of the stake." (p. 6, lines 24-27).	Storing data associated with <u>calling order sequence</u> was well known in the art long before the Katz filing. <u>Barger, Jr. et al.</u> , U.S. Patent No. 4,071,698, "Telephone System for Audio Demonstration and Marketing of Goods or Services," discloses storing time stamp data with each call.	As another example, Levine, U.S. Patent No. 4,531,023, filed Aug. 13, 1982, discloses: "In addition the caller's phone number and address, the time of call and date of call is also forwarded by tracer 28 to security computer 44." (Levine, Col. 5, Lines 52-55).	Simultaneously, a check is carried out in an auxiliary memory 10 in order to determine whether the <u>phone number of</u> the <u>subscriber has already been recorded for the current Lotto game</u> . Should this be the case a reply apparatus which is connected to the auxiliary memory 10 will, via this memory, transmit the following message to the subscriber: "Your stake has been refused, considering you have already entered a previous stake for participation this week." (p. 5, lines 14-19).
indicative of the calling order sequence of said individual callers; and			qualification structure controlled by said record structure for restricting the extent of access to said system by said individual callers based on said consumable participation key for said respective individual caller being entitled to a one time use.

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Claim 57: U.S. Pat. No. 5,255,309

Claim Elements	The Prior Art – Bestler et al. U.S. Pat. No. 4,755,872 filed Jul. 29, 1985, issued Jul. 5, 1988
Analysis control system for use with a communication facility	"The preferred embodiment of the invention is the Zenith PHONEVISION system. As shown, the system comprises a plurality of telephone communication units (TCUs) 20 each <u>located at corresponding telephone company central office 22</u> ." (Col. 5, Lines 51-54).
	"Several central offices 22 are shown in Fig. 1 to indicate the several central offices of any metropolitan area." (Col. 5, Lines 54-56).
including remote terminals for individual callers, wherein said	"The cable subscriber would then use his telephone to enter the ANI code and then four or more digits." (Col. 6, Lines 14-16).
remote terminals may comprise a conventional telephone instrument including voice	
communication means, and digital input means in the form of an array of	
alphabetic numeric buttons for providing data,	
and wherein said facility may provide called terminal DNIS signals,	"The telephone company central office 22 serving the cable subscriber's telephone area will be alerted by the ANI code so that when it receives the call, it will transform the 'dialed' phone number (called the 'destination telephone number') and other data into the so-called bulk calling line identification (BCLID) format by using the ANI
said analysis control system comprising:	<u>computer</u> ." (Col. 6, Line 23-29).
an interface structure coupled to said communication facility	Interface Structure: Associated Elements: ANI Computer 24, cable 26, TCU 20, Modem 30, leased telephone, Lines 32

Material claim element terms are in bold. Corresponding prior art disclosure is underlined.

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**	The remote terminals call the central office and communicate with the interface. As is known in the art, telephones are capable of voice and digital communication, as are all central offices.
digital communication, digital communication, cable headen controller (TC	As can be seen in Fig. 1, the TCU is able to send data to the cable headend station via Modems 30 and leased telephone, Lines 32. "Coupled to each telephone communication unit 20 is a corresponding modem 30. Modems 30 are coupled via leased telephone, Lines 32 or other communication channels to corresponding modems 34 located at cable headend stations 36. Each modem 34 is coupled by a cable 38 to a respective telephone communication controller (TCC) 40." (Col. 5, Line 66 through Col. 6, Line 4).
Bestler disclo	Bestler discloses how data is sent from the ANI compute to the TCU: "This data is sent by the ANI computer 24 to its corresponding TCU 20 asynchronously without handshaking, and can be a continual data stream." (Col. 7, Lines 15-17).
"The nineteen ASCII (Col. 8, Lines 28-30)	"The nineteen ASCII characters sent by TCU 20 to its TCC 40 are sent via a line using a contracted SDLC protocol." (Col. 8, Lines 28-30).
voice generator structure Using voice g	Using voice generator structures in impulse pay-per-view systems was well known in the art at the time of the filing of Bestler.
For example, considering the From confrontation to disclosed by Bestler:	For example, consider an article published by the Yankee Group in June of 1983, entitled "Cable and the Telcos: From confrontation to Détente" This article discloses the use of a voice generator in a system similar to the system disclosed by Bestler:
The central e already has <u>ii</u>	The central exchange office contains a computerized voice response device. "Every telco central exchange office already has installed a computerized voice-response device." (Yankee Group Report, p. 163).
coupled through said The compute interface structure for help service	The computerized voice response device is capable of providing vocal instructions, as it "originally was designed to help service personnel be sure they hooked up newly installed telephones to the correct line and corresponding

actuating said remote	number " (Vanless Carrette Destate 162) Tra
terminals as to provide	and receives and responds to information generated at the remote terminals.
individual callers;	In the "U.S. Approach," the voice response computer device prompts the caller to enter a "user number" for additional identification.
record structure including memory and control means,	Associated Elements: System Controller 46 (Control Means) and Billing Computer 50 (Memory):
connected to receive said caller data signals from said interface structure for addressing a file	"An important function of each TCC 40 in the preferred embodiment is to convert the ASCII data received from its corresponding TCU 20 into a format more readily usable by the system controller 46." (Col. 10, Lines 31-34).
and storing digital data relating to said individual callers provided from said digital input means through said interface structure	The billing computer in conjunction with a database updates files to bill the appropriate subscriber. "System control 46 processes the four sixteen bit words of FIG. 9 to identify the cable subscriber, find the subscriber's decoder address, and change the decoder authorization to allow viewing of the program selected by the subscriber (or to implement a cancellation at the subscriber's request).
to store representations indicative of the calling order sequence of said individual callers and other data provided by said individual callers; and	Bestler discloses time-stamping every transaction and storing the transaction. "In addition, from the output 166 information <u>including the converter identification</u> , the <u>program identification</u> , and a timestamp are posted to a disk at 170 within system controller 46." (Col. 15, Lines 35-38).

Claim 57: U.S. Pat. No. 5,255,309

qualification structure controlled by said record structure for restricting the extent of access to said system by said individual callers to a one time only use.

that the caller can order a pay-per-view event. Second, part of the dialed number (as determined by DNIS) is a user-Bestler discloses using two forms of qualification. First, the calling number is used to qualify the caller, and ensure supplied password which is used to further qualify the caller.

base reflects the unavailability of the event for purchase by that particular subscriber, because of bad credit, tardy bill "In the event that system control 46 cannot map the telephone number into a converter code (because, for example, of a wrongfully dialed telephone number), an error is generated at 158. That error can also be generated if the data payments, or whatever reasons are considered to be adequate by the cable company." (Col. 15, Lines 9-17)

household where a cable television system has been installed, parents may, through the use of a password, prevent Next, the Z digit may represent a password which is useful for security purposes. For example, within a given access by children to certain types of pay per view programming." (Col. 4, Lines 35-40)

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[®]The Yankee Group, 19

Although Zenith's Tele-2-Way solves the touch-tone and impulse problems, this unique hybrid approach may actually aggravate the local telco's inability to handle the avalanche of calls that accompany blockbuster PPV events. The result: an "instant replay" of the Gill Cable experience -- that is, telephone brownouts or blackouts, and the concomitant loss of orders and customer good will. What's clearly required is a cooperative solution that balances the needs of the cable operator with the capabilities of the public switched telephone network.

V. Telco Systems and Services

At midyear 1983, the 22 wholly owned — but soon—to—be—divested — Bell operating companies are planning a wide array of new residential and business services that will be introduced once they are cut free of Ma Bell's apron strings on January 1, 1984. Already, another BOC, Southern New England Telephone (SNET), has struck out on its own with a bold advertising blitz in national business publications aimed at penetrating the unregulated corporate telecommunications services market before American Bell/AIS has firmly entrenched itself as the packager of such services nationwide. SNET gotthe jump on the 22 other BOCS because, as a partially owned ATLT subsidiary (ATLT holds only 24% of its stock), it is not constrained by the terms of the Modified Final Judgement.

Currently about one-third of the BOCs are informally courting their local cable operators for potentially lucrative services contracts. Until now, cable operators have been reticent to establish anything but the most perfunctory business relations with local telcos because of the long-standing antagonism between the two industries. Still, cable operators eager to cash in on the promise of PPV -- without having to invest heavily in upgrading or rebuilding their cable plants to two-way interactive capability -- are

considering co-ventures with their local telcos as a cost-effective, interim measure.

A. The Canadian Approach

Every telco central exchange office already has installed a computerized voice-response device that originally was designed to help service personnel be sure they hooked up newly installed telephones to the correct line and corresponding number. When coupled with their Automatic Number identification (ANI) system — now used for long-distance call billing purposes — telcos are already well-equipped to automatically process PPV orders for cable operators. Bell Canada, in fact, recently proposed a field test of an ANI system adapted to handle PPV order processing; the Yankee Group expects Bell Canada to offer ANI-based PPV order taking as soon as it can squeeze through the government's tariff-setting bottleneck for new service offerings.

1. Low Tech and Low Cost

Bell Canada developed the ANI proposal in conjunction with Rogers Cablesystems, the world's largest MSO, and the Cable Telecommunications Research Institute (CTRI). By using ANI systems already installed in 30 central exchange offices in Toronto, Bell Canada estimates it can process and transmit ppv orders to five cable headend computers simultaneously in that city. And, even when dealing with a blockbuster ppv event, Bell Canada's ANI-derived system can handle up to 80% of all subscribers' orders in the last half hour before the event (cable companies would have to pay for the necessary trunk capacity).

By processing orders at the central exchange office level -- rather than funneling all orders to a single location -- Bell Canada also believes subscribers are no more likely to get

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a busy signal when calling in their PPV orders than when placing long-distance telephone calls. (Bell Canada and CTRI assume that 75% of PPV requests occur in the last half before an event, and that over 40% of requests are concentrated in the final 5 to 25 minutes before the event starts, as shown in Exhibit 5-7.)

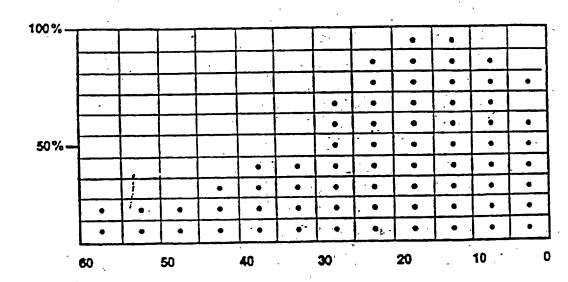
2. Costs

The costs of impulse PPV are a function of when the orders are taken. If manual order taking is well-managed, it costs as little as 25¢ per order taken. The problem is that at peak impulse buying times, the capacity or local teleos may be inadequate, and the cost of making it adequate may be prohibitive.

Unlike manual order entry systems, the costs associated with the Bell Canada/CTRI approach (approximately \$4 per subscriber per year) are relatively insensitive to the number of events ordered. The only modifications needed to adapt most telco ANI systems to handle PPV order-taking is an inexpensive black box containing microprocessors programmed to "fool" the ANI system into thinking that it is dealing with a long-distance call. On the cable side, the only requirements are:

- a local private line, permanently installed as a data channel between the telco office and cable headend, to forward ppv orders from the telco exchange office computer to cable headend billing and enabling computers;
- software and microprocessors to handle the incoming order stream, match phone numbers to subscriber addresses, send authorizations, and record billing information. (Exhibit 5-9.)

EXHIBIT 5-7
EXPECTED PATTERN OF PPV PEAK CALL DEMAND



Minutes Before Event

Source: (Canadian) Cable Telecommunications Research Institute

EXHIBIT 5-8 CANADIAN HYBRID CABLE/TELCO PAY-PER-VIEW SYSTEM

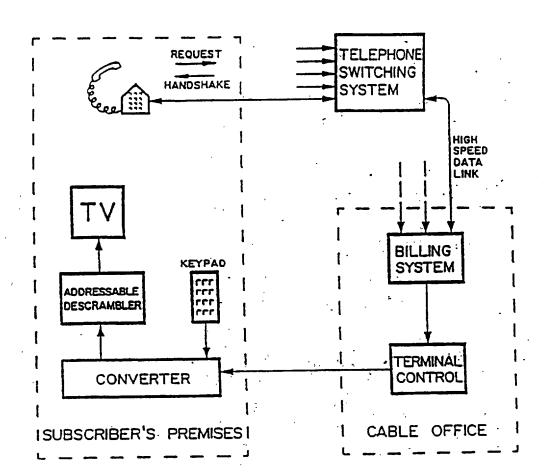
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Source: (Canadian) Cable Telecommunications Research Institute

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A key advantage of the Bell Canada/CTRI approach is that it does not require any new hardware in the home (beyond an addressable converter and dial-up or touch-tone phone). Due to its quick startup capability and low cost (to telcos, cable operators and consumers), the Yankee Group expects this type of 'low-tech' configuration to rapidly emerge as the 'North American Hybrid Standard."

B. The U.S. Approach

Before agreeing to divest itself of its local operating companies in the U.S., AT&T had initiated an effort to exploit its ANI system's PPV order-processing potential as well. Since then, several BOCs have seized the initiative themselves and have begun testing ANI's potential on their own under the ever watchful eye of Bell Labs. Both Illinois and Hichigan Bell are planning field tests of ANI-based, PPV order-taking systems with cable operators in the Chicago and Detroit areas before yearend 1983. The Yankee Group, however, believes the systems being developed by American BOCs are unwieldy when compared with those of its Canadian counterparts.

Unfortunately, AT&T designed its ANI-system without the benefit of a close working relationship with any U.S. cable operators -- and this shows. Rather than simply and quickly identifying those customers who call a specified number to request a particular PPV event, the U.S. ANI system requires customers to key in a "user number," to verify that their account is paid up, before authorizing the transaction. Not only is this authorization technique likely to triple or quadruple the amount of time required to take each PPV order -- from five 6 10 seconds with the Canadian system to 30 seconds or more -- it also requires that all potential PPV customers be equipped with touch-tone keypads (less than half of all U.S. households).

1,162,336 (11) (A) No.

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(51) INT. CL. G06F 15/22,15/28

(19) (CA) CANADIAN PATENT (12)

(54) SYSTEM FOR ENTERING AND PROCESSING GAMBLE STAKES

(72) De Bruyn, Jacques, Belgium

(21) APPLICATION No.

368,134

(22) FILED

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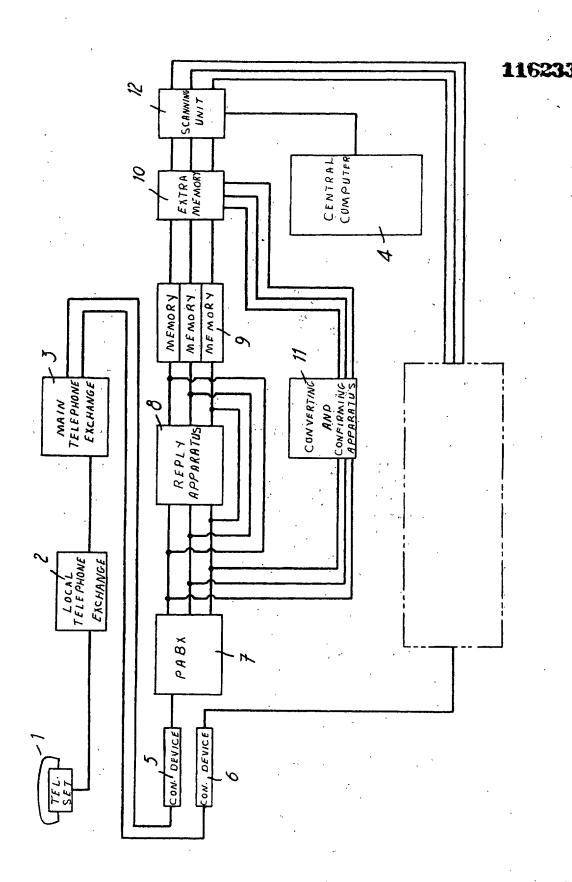
(30) PRIORITY DATE

Belgium (2/58328) 800110

No. OF CLAIMS

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The present invention is concerned with a device for permitting the use of the telephone for immediately entering a gambling stake, right up to a short time before the drawing of the winning numbers, on the Lotto or on any other authorized game of chance.

Up till now it was required, in order to be able to participate in the game of Lotto, to collect a prescribed form from a recognized distributor, to fill in this form and to return it. Subsequently these forms had to be checked by the Lotto authorities in order to designate the winning participants.

The main drawbacks to this manner of proceeding are that an unnumerable number of printed forms are required, which then have to be distributed all over the country and that one can only take part in the game up to a relatively long time before the actual drawing starts. A further important drawback is that the unabled, who has no possibility of transportation, is unable to take part in the game without calling upon the aid of other people.

In order to avoid the aforesaid drawbacks and in accordance with the broad concept to the present invention, there is provided and claimed herein a system for entering and processing gambling stakes, comprising: at least one reply apparatus, for connection to a telephone exchange to which a subscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber; a memory connected to said reply apparatus for the temporary recording of the subscriber's telephone number and of selected game figures upon which the subscriber enters a stake; a convertor and reply apparatus connected to said memory and for connection to said telephone exchange, for conversion of information, recorded in said memory, into spoken language and repetition

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thereof to the subscriber; a central computer connected to said memory for permanent recording of information temporarily recorded in said memory and for recording a sum of money to be charged to the subscriber, and a scanning unit connected between said memory and said central computer for transmitting information recorded in said memory to said central computer and for erasing said information entered in said memory.

Besides eliminating the previously mentioned drawbacks, the above system offers the advantage of being able to take part in the game up to a short time, one hour for instance, before the winning numbers are drawn, and that even disabled persons can take part by using their telephone. The switching in of the telephone network for the game of Lotto also is to the advantage of public Telegraph and Telephone Utilities Companies. People will moreover more readily take part in the game by phone than they would by means of printed forms. In this manner, participants who avail of very little time or who wish to place a stake at the last moment, are offered the possibility of doing so with a minimum of trouble. This device will also permit a considerable saving in personnel, so that costs are reduced and the winning participants can be very quickly determined and payed out. The relatively high cost of investment for putting to use this device according to the invention becomes totally negligible in view of the results obtained. Yet another advantage is that the commissions at present payed to the distributors could revert to the operator of the new device according to the invention.

Merely as an example, and without the slightest intent of restriction, a detailed description is given hereinafter of a preferred embodiment of the invention. This description refers to the appended drawing, which shows a block diagram of this device

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For the sake of clearness, this drawing only shows one single telephone set 1, which is connected in the well known manner to the local telephone exchange 2, which in its turn is in connection with one of the main exchanges 3 5 which are used for international telephone traffic and to which is connected the entire Lotto computer device described hereinafter. This device may consist of several groups of electronic apparatus assembled in the same manner, each group of which is intended for the processing of a specific language and shall preferably be connected to the same central computer 4. In the present case is connected to main exchange 3 a connection device 5 and a connection device 6, which automatically and respectively connect Dutch speaking subscribers to the group for the Dutch language of the com-15 puter device and the French speaking subscribers to the group for the French language of the computer device. In consideration of the previously stated fact that both groups are assembled in the same manner, only one single group will be described hereinafter. The second group is shown in the drawing in dot-dash line. Each connection device, respectively 5 and 6 is connected to a so-called PABX apparatus 7 which distributes the telephone conversations over several telephone lines, thus considerably increasing the capacity of the device. A telephone reply apparatus 8 is connected to the outgoing lines thereof in order to give instructions to the telephone subscribers. A memory 9 is connected to each telephone line in order to record the selected Lotto figures and the subscriber's telephone number. Preferably, an extra memory 10 shall be provided in the group for the purpose of

checking the permitted number of stakes per week by one and the same player. This memory operates in conjunction with a converting and confirming apparatus 11, which will advise the telephone subscriber of the possible refusal of a certain stake. This converting and confirming apparatus 11 is also provided to be able to convert into spoken language the Lotto figures recorded in the memories 9, repeating these recorded figures to the telephone subscriber as a check. A scanning unit 12 is also provided for transmitting the information recorded in memories 9 to the central computer 4 and for subsequently cancelling the entered information.

The operation of the device described above is detailed hereinafter.

The telephone subscriber who wishes to take part in a game, such as for instance a Lotto game, hooks off the receiver from set 1 and hears the normal selector tone. After selecting, for instance the digits 00 of the automatic international service, the connection is made with the main exchange 3. After the signal is heard which precedes an in-20 ternational conversation, the subscriber selects the telephone number which has been awarded to the Lotto game, whereby he is automatically connected to the Lotto computer device. If we presume that the subscriber number is a telephone number which is attributed to a Dutch speaking subscri-25 ber, the connection device 5 will switch the subscriber to the group of Dutch language of the device, and the PABX apparatus 7 will set up a connection with a free line of the reply apparatus 8 which will then, for instance convey the following message: "You are connected to the central

Δ.

computer of the national Lotto. After hearing the first signal, please select your first chosen number by means of the selector device of your telephone set. After each signal you select the following numbers, in arithmetical order.

5 After your last choice of numbers, the computer will repeat the chosen numbers. Best of luck, and start now". After the numbers have been selected following each signal, the impulses brought about by the selector device are converted to computer language and stored in memory 9, so that in other 10 words, the selected Lotto numbers and the telephone number of the subscriber are recorded. Simultaneously, a check is carried out in an auxiliary memory 10 in order-to determine whether the phone number of the subscriber has already been recorded for the current Lotto game. Should this be the case, a reply apparatus which is connected to the auxiliary memory 10 will, via this memory, transmit the following message to the subscriber: "Your stake has been refused, considering you have already entered a previous stake for participation this week". In this manner, the possibility is avoided of abnormally high stakes being entered per participant, which are only charged later by the Telephone Utilities Company. When however the stake is accepted, the information of memory 9 is transferred to the conversion and reply apparatus 11, which converts the information to spoken language and informs

the telephone subscriber thereof, so that the latter can check whether the correct Lotto numbers have been recorded. Subsequently, the receiver is hung up again so that the telephone connection is severed. The conversion and reply apparatus 11 may be of any type whatever and may comprise a number

of electronic switches, so-called gates, as well as for instance fourty different tape tracks, which can be fed in one at a time, as and when these tracks are switched on by the preselection of the gates. After the receiver has been 5 hooked back, an impulse is transmitted to memory 9, which passes on the subscriber's number and the selected Lotto numbers to the scanning unit 12 and to the central computer 4, in which all the information is recorded on computer tape, after which the scanning unit erases the transmitted information in memory 9, so that space becomes free in thismemory for new information. Should the telephone subscriber not agree with the repeated numbers, he may for instance select the digit O on his phone selector, whereby the information in memory 9 is erased and the amount of the stake is not charged. 15 In such a case, only the phone call will be charged, and the subscriber may start over again.

The charges for the stakes can be determined in accordance with the number of selected figures, and in order to avoid abnormally high stakes, a maximum amount can be preset which, when exceeded, would be refused by the computer device. The computer device would also refuse a stake, when for instance figures are selected which do not correspond to the Lotto figures.

The device described above will identify the subscriber and charge him the phone call and stake costs on his usual telephone bill, which shall also state the selected Lotto figures and the cost of the stake.

In order to select the players, the Telephone Company may, should it wish to do so, attribute a secret code to each

player, which should then also be dialed in order to obtain the connection with the computer device.

Before the drawing of the winning numbers is started, the magnetic tape of the central computer 4 is sealed and safely stored away. After the drawing, the computer is programmed with the winning numbers and the magnetic tape is then read in at high speed. As a result, the computer documents will state the phone numbers of the participants, the number and the value of the selected figures and the amount which is charged on the telephone bill. The winners of prizes are identified and payed out with a check or by any other means.

It is perfectly obvious, that some of the above described components of the device could be replaced by others

which pursue the same purpose and that other combinations of the components previously described could be considered, as long as they remain within the scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

- System for entering and processing gambling stakes, comprising:
 - (i) at least one reply apparatus, for connection to a telephone exchange to which a scubscriber's telephone is connected, to permit instructions concerning the game to be given to that subscriber;
 - (ii) a memory connected to said reply apparatus for the temporary recording of the subscriber's telephone number and of selected game figures upon which the subscriber enters a stake;
 - (iii) a convertor and reply apparatus connected to said memory and for connection to said telephone exchange, for conversion of information, recorded in said memory, into spoken language and repetition thereof to the subscriber;
 - (iv) a central computer connected to said memory for permanent recording of information temporarily recorded in said memory and for recording a sum of money to be charged to the subscriber, and
 - (v) a scanning unit connected between said memory and said central computer for transmitting information recorded in said memory to said central computer and for erasing said information entered in said memory.
- 2. System as defined in claim 1, in which an auxiliary memory is provided in the device in order to check the number of stakes entered for one same game by the

telephone subscriber.

- 3. System as defined in claim 1, in which an apparatus is connected between the telephone exchange and the central computer for a telephone line distributor, with a memory on each telephone line, for the temporary recording of the telephone number of the telephone subscriber and of the selected figures upon which a stake is entered.
- 4. System as defined in claim 1, in which there are connected between the telephone exchange and the central computer for each spoken language, a reply apparatus and a conversion and reply apparatus in the language concerned.



ABSTRACT OF THE DISCLOSURE:

Device permitting the use of the telephone for entering stakes on the Lotto or on any other authorized game of chance. It comprises a reply apparatus connected to the telephone exchange of the Telegraph and Telephone Utilities Company, in order to give instructions concerning the game to the telephone subscriber who wishes to take part in the game, as well as a central computer in order to record the phone number of the telephone subscriber, the selected figures or other symbols upon which the stake is entered, as well as the amount to be charged to the telephone subscriber.

United States Patent [19]

Bestler et al.

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4,755,872

[45] Date of Patent:

Jul. 5, 1988

[54] IMPULSE PAY PER VIEW SYSTEM AND METHOD

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Sirazi, Chicago, all of Ill.

[73] Assignee: Zenith Electronics Corporation,

Glenview, Ill.

[21] Appl. No.: 760,218

[22] Filed: Jul. 29, 1985

[51] Int. Cl.⁴ H04M 11/08; H04M 15/00; H04N 7/10; H04H 9/00

[56] References Cited

U.S. PATENT DOCUMENTS

3,920,908	11/1975	Kraus .
4,163,254	7/1979	Block et al 358/84 X
4,460,922	7/1984	Ensinger et al 358/122
4,518,989	5/1985	Yabiki et al 358/86
4,536,791	8/1985	Campbell et al 358/86 X
4,554,418	11/1985	Toy.
4,558,464	12/1985	O'Brien, Jr 358/86 X
4,590,516	5/1986	Abraham 358/86

FOREIGN PATENT DOCUMENTS

103438	3/1984	European Pat. Off 358/86
217308	4/1987	European Pat. Off
WO85/03830	8/1985	World Int. Prop. O 84/
		World Int. Prop. O 358/86

OTHER PUBLICATIONS

The Yankee Group, "Cable and the Telcos: from Confrontation to Détente," Jun. 1983, pp. 162-167.

A. F. Bulfer, "Dial-A-View," talk given at the Motion Picture Industry Seminar, Dec. 3, 1984, Los Angeles, Ca.

Bulfer et al., "A Trial of a National Pay-Per-View Ordering and Billing System," NCTA Technical Papers, Cable 86, Dallas Tex., Mar. 1986. Zenith Electronics, "Advanced New Cable TV Technology Developed for Impulse-Pay-Per-View," Jun. 3, 1985, press release published by Zenith Electronics, Corp. Glenview, Ill., obtained from Dialog Data Base, 'File 621'.

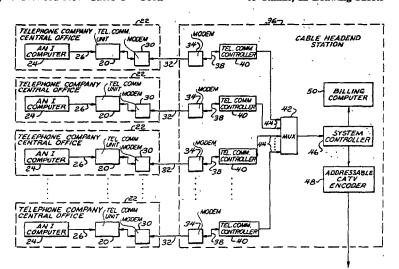
Sirazi et al., "Comparative Study of Hybrid IPPV Implementations" presented Jun. 3, 1985 at Cable 85, Las Vegas, Nv.

Primary Examiner-Keith E. George

[57] ABSTRACT

An IPPV technique is provided for a cable system having one-way addressable converters. Each of several central offices in a metropolitan area will provide ANI information representing the cable subscriber's phone number and a code representing the cable event to be viewed or cancelled. The data is sent asynchronously to a respective telephone communication unit located at the central office. This telephone communication unit (TCU) does some buffering, eliminates unnecessary data, and sends data synchronously to a telepone communication controller (TCC) located at the cable headend station. The TCC will acknowledge the data. There will be several TCCs located at the cable headend station corresponding to the several central offices who may give telephone service to the cable operator's subscribers. All of these TCCs at the headend station are coupled through a multiplexer to a system controller. Each TCC provides intermediate processing which converts the subscriber's telephone number into binary. The multiplexer provides buffering, flow control, and arbitration among various TCCs. The multiplexer adapts to data flow conditions. The system controller receives data from each subscriber, locates a corresponding home terminal unit address, examines the password and other information, and maps the two digit program identification which was entered by the subscriber into an authorization code. It then authorizes the home terminal units in accordance with the IPPV requests by transmitting the subscriber's cable address and a new authorization code in the vertical blanking interval, generates the commercial transaction, and downloads the transaction to a billing system.

63 Claims, 12 Drawing Sheets



F1G. 1



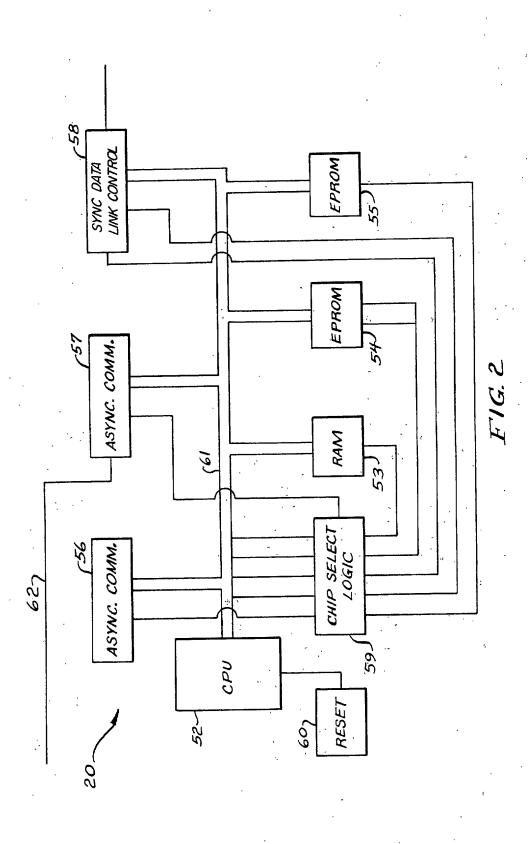
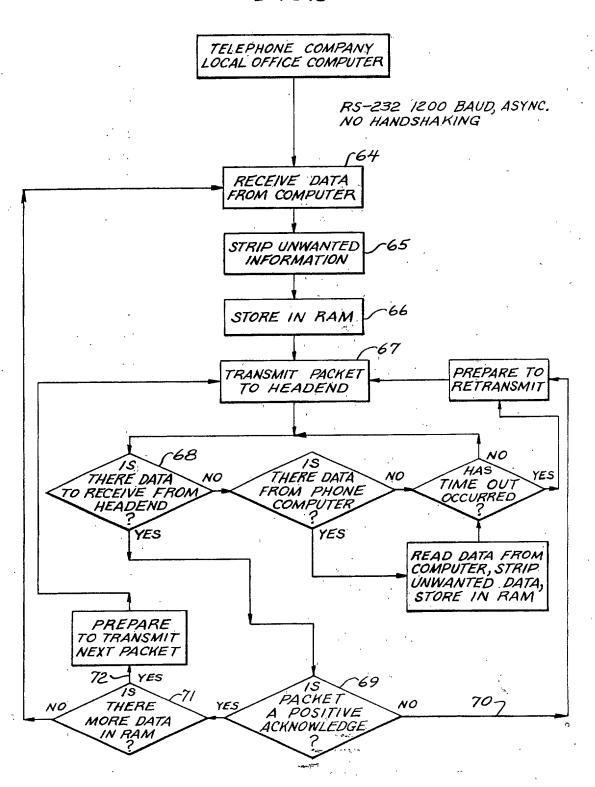
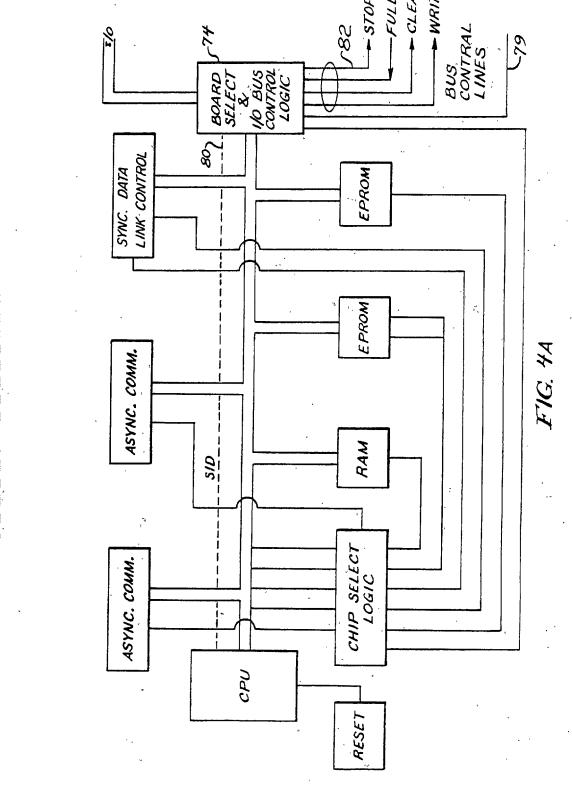
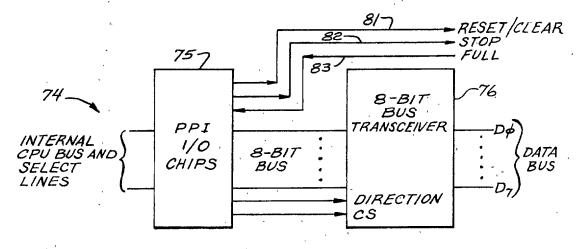


FIG.3





BOARD SELECT & I/O BUS CONTROL LOGIC



FROM
CHIP SELECT > WRITE
LOGIC FIG 4A

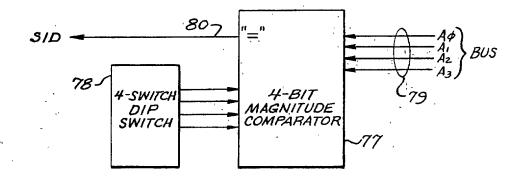


FIG.4B

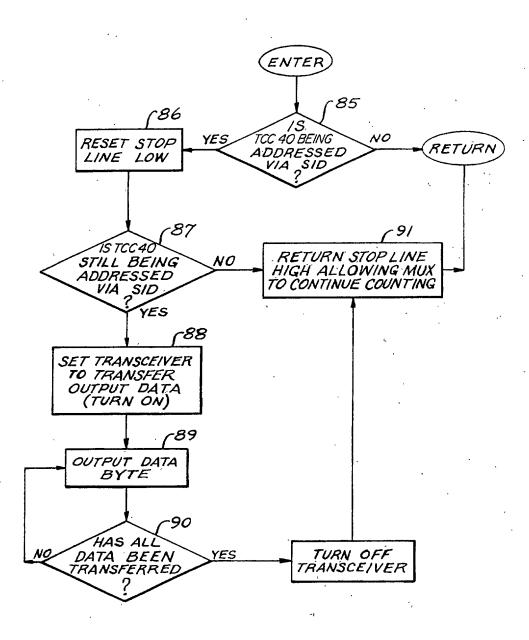


FIG. 4C

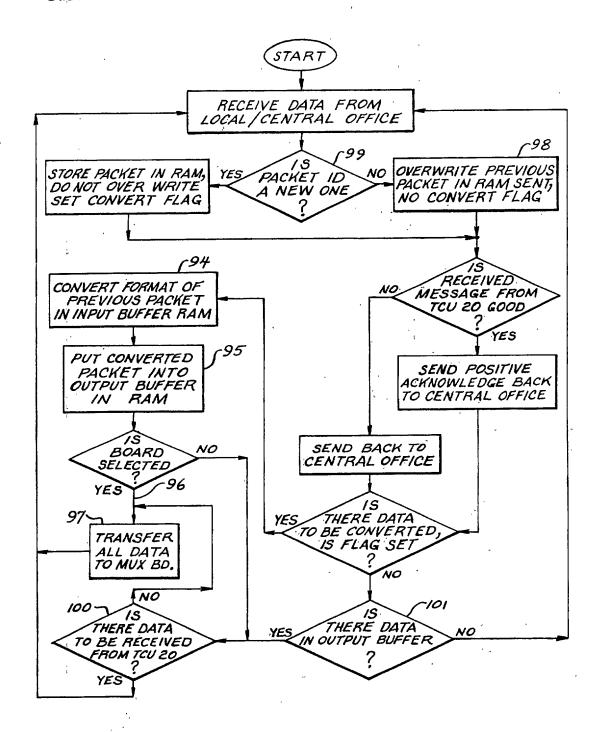
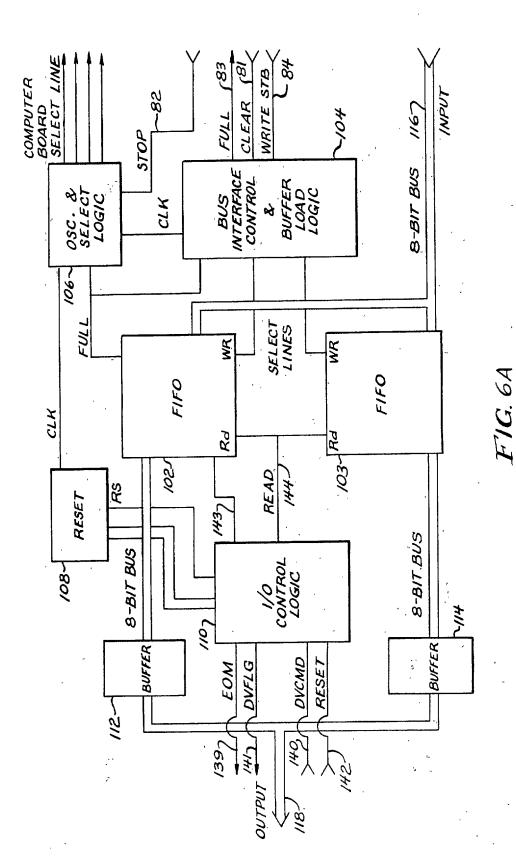
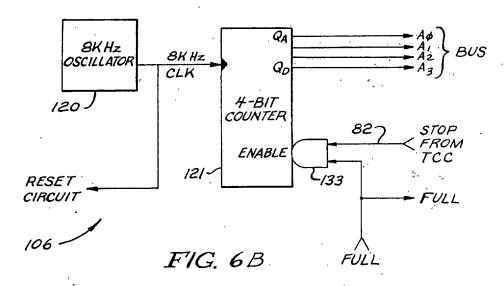


FIG.5



OSC & SELECT LOGIC

Jul. 5, 1988



BUS INTERFACE CONTROL & BUFFER LOAD LOGIC

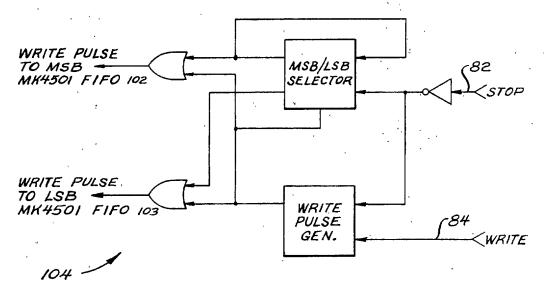


FIG. 6 C

T 12 Con the second second RESET

INPUT

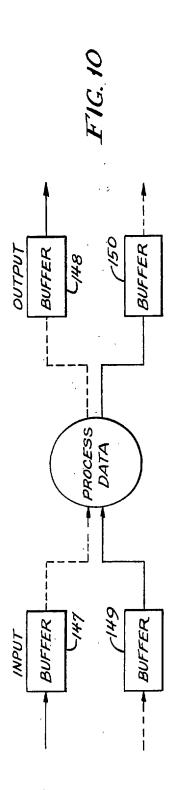
FIG. 7

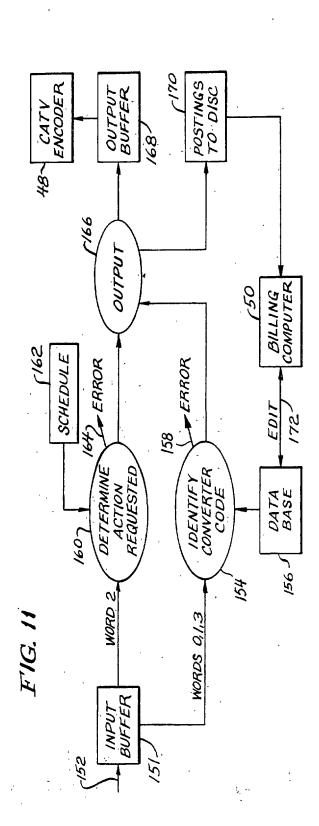
OUTPUT TCC

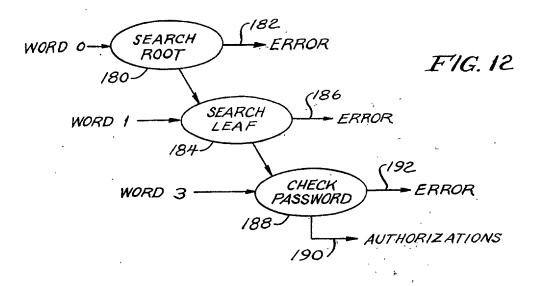
(130

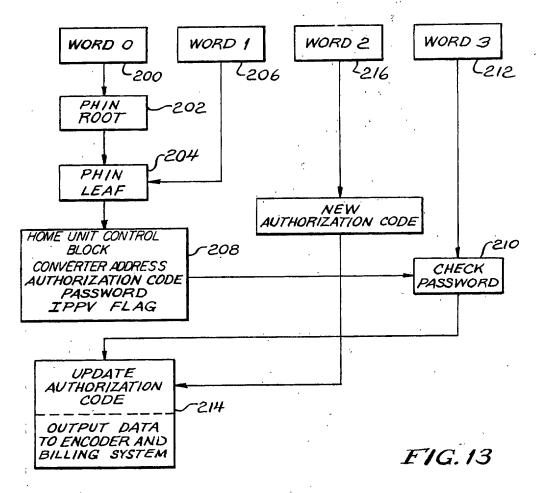
FIG. 9 MSB LSB CCC-Cxxx (IN BINARY) WORD O XXX-XLLL (IN BINARY) WORD / ZEROES EVENT # (IN BCD) ZEROES WORD 2 C 145 PASSWORD (IN BCD) WORD 3 **ZEROES** 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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IMPULSE PAY PER VIEW SYSTEM AND METHOD

BACKGROUND OF THE INVENTION

The present invention relates to cable television and particularly to a technique whereby a cable subscriber can send a request via telephone to the cable operator to receive only a selected cable program. This is known as an "impulse pay per view" system.

The preferred embodiment of the present invention is compatible with one-way addressable CATV systems. Prior to describing the invention, it will be useful to have a rudimentary understanding of a typical one-way addressable CATV system. In use, a cable operator at a "headend" station receives signals via satellite, microwave, and super trunks, encodes the signals, modulates them, and provides them to the cable plant. The cable plant is a distribution network typically carrying up to 80 channels or more over a distance of up to 20 miles or 20 so to various subscribers. Each of the cable subscribers is provided with a one-way addressable converter (also called a decoder) which is connected to the cable and to a television receiver or monitor. The basic function of the converter is to interface the cable signals with the 25 subscriber according to authorization codes received from the headend. The subscriber will select a channel containing a program desired to be viewed. The converter will determine whether that channel or program on the channel is authorized for viewing by the sub- 30 scriber. If so, the converter descrambles the selected signal provided by the cable operator and provides a descrambled signal to the television receiver or monitor. The scrambling may, for example, be done by sync suppression wherein sync information is randomly sup- 35 pressed, as well as video inversion.

To achieve the foregoing system, use may be made of the vertical blanking interval, e.g. line numbers 10, 11, 12 and 13, or an out-of-band data channel during which information can be transmitted by the headend station 40 to the subscribers or any selected subscriber. Each converter has a respective unique address code illustratively having 20 binary bits so that over one million subscribers can be individually addressed by the headend. Additionally, each converter typically includes a 45 random access memory (RAM) which is capable of storing 20 bits, for example. Each of the stored bits is representative of a service or channel which may be subscribed to. Typically, at installation, the RAM is loaded with all zero bits. When the subscriber chooses 50 the services he wants, that information will be entered as data in a subscriber data base. The subscriber data base is accessed by a system controller at the headend station which is capable of addressing any or all of the converters in the field. The system controller also com- 55 municates with a billing and management computer.

More particularly, in this example the system controller transmits a selected 20 bit address code (sometimes referred to as an "identification code") followed by an associated authorization code using each of line num-60 bers 10, 11, and/or 12 in the vertical blanking interval. Each converter receives the 20 bit address code, but only one converter will decode it as matching its own unique address. Following the transmitted 20 bit address code are the five bits of the authorization code. 65 These five authorization bits will be loaded into a proper location in the RAM, the location having been determined by information from line 13 in the prior

field. The RAM in the converter will illustratively contain 20 bits arranged in four groups which may be called row A, row B, row C, and row D. Illustratively, the five bit authorization code will be loaded into one of the rows of the RAM. Line number 13 of the vertical interval is used to transmit a "program tag," a "market code," and further information to the converters in the field. The market code is used to prevent a converter from being taken from one cable market to another market. The transmitted program tag is used to identify a particular channel or program and is compared in the addressed converter with the stored authorization bits to establish whether that converter is authorized to descramble the corresponding program material. Illustratively, this is done by performing a logical AND operation between the 5 bit program tag transmitted on line 13 of the channel which has been selected by the subscriber with the content of a selected row of the RAM. The result of this logical operation will indicate to the converter whether the selected channel or program on the channel has been authorized to be descrambled by the converter. It will be appreciated that each of the channels transmitted by the cable operator has its own respective program tag. This particular system has exceptional versatility in that the contents of the RAM at any subscriber's converter can be changed instantly via the system controller through the transmission of the appropriate address code during the vertical blanking interval followed by updated information for storage in the RAM. Moreover, there can be tiers of authorization wherein various programs on a given channel will be authorized for some subscribers but not for others, depending on the service to which they have subscribed. For further information about one such addressable system, refer to Ensinger and Hendrickson U.S. Pat. No. 4,460,992, whose disclosure is hereby incorporated, which patent is owned by Zenith Electronics Corp.

To date, the market penetration of cable systems has been on the order of only 50 percent. Some television owners prefer not to pay the monthly charges for cable service to receive one or more of the packages or services provided by the cable operator. These non-subscribers, however, may be willing to pay the cable operator for only an occasional program. Such type of service is called "pay per view." In order to achieve this and to provide control over billing, the cable operator must have information regarding what programs are desired by various subscribers. In an addressable CATV system of the type described above, for example, a particular subscriber's converter may be updated so that it will descramble a given program—once it is determined that the subscriber is willing to pay for that program. This can be done by having the subscriber telephone the cable operator in advance of the program to be purchased, mail a postcard, or communicate by some other

The problem with this type of service, however, is that it precludes impulse purchases and simultaneous response from the time the pay-per-view subscriber determines he wishes to purchase a particular program and the time it is actually viewed by him. It would be considerably more advantageous to permit a subscriber to obtain immediate results by, for example, pushing a button. This would alert the cable operator to a request for service. The system controller at the headend station immediately would change the contents of the

RAM at that subscriber's converter to permit the selected program to be descrambled. This is called "impulse pay per view" (IPPV) service.

The problem facing the industry is how to provide a system permitting IPPV service. In 1975, the Federal Communications Commission mandated that all cable systems being installed would be required to have twoway communications capability. This would permit interaction between the subscriber and the headend station. To date, about 20 percent of installed systems 10 are capable of two-way communications, and of these only about one-half have active two-way communication. With two-way communication, the subscriber can use his home terminal or other unit to communicate with the headend station and achieve IPPV. The prob- 15 lem, however, resides in providing a mechanism for other subscribers served by one-way cable systems, which constitute the vast majority to have IPPV service.

For cable subscribers without two-way cable systems, a hybrid system is required for impulse pay per view service. This involves a telephone request by a subscriber for a PPV cable event followed by delivery from the cable operator headend station to the individual subscriber of a new authorization level permitting 25 the PPV cable event to be descrambled.

The problem with hybrid systems using the telephone is substantial. The telephone system in a given city or community includes one or more central offices, each communicating with up to about 50,000 telephone sub- 30 scribers. Each of the several central offices communicates with the others by trank cables. The headend station of the cable operator will be located within a region serviced by one central office. When cable subscribers telephone for pay per view service, their tele- 35 phone central offices will route all of the telephone calls to the one central office servicing the headend station. Too many telephone requests at the same time to the cable operator can cause the telephone central office to "crash" due to excessive requests for physical telephone 40 connections between numerous telephone subscribers and a single cable operator headend station. This problem is common to all hybrid systems, whether a manual telephone system or an automatic dialing system is used.

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Further problems attend manual call-in systems and 45 auto-dialing systems. The manual call-in systems are labor intensive, require long processing and holding time, have limited capacity, are not impulse in nature, and have lower penetration. They also involve possible human error. Auto-dialing systems have an advantage 50 over manual systems, except that there is the additional expense of in-home installation of the automatic dialer.

To avoid overloading on the telephone system, one solution to providing IPPV service for one-way addressable cable systems would be to refrain from making physical telephone connections between the cable subscribers and the headend station through the various central offices. To achieve this, a new system based on automatic number identification passing referred to as "ANI passing" has been developed. ANI passing is an 60 upgrade achieved by adding software to some central offices or by adding hardware to others, depending on their existing capabilities. In ANI passing, the central office of the telephone company will collect information based on each subscriber telephone call and pass it 65 on to other equipment.

Thus, when a cable subscriber intends to make an IPPV request and picks up his telephone (takes it "off-

hook"), a dial tone is issued to the subscriber's premises by the telephone company, and the telephone number is automatically identified, as customary within the telephone company. Now the cable subscriber can enter information using the telephone. Typically, to place a phone call, seven digits (or ten, if an area code is needed) are entered. To use ANI passing, however, some prescribed sequence of digits is used. This can take vertically any form. For example, the subscriber may enter "*85" or any other prescribed NNX number (exchange number) and then some number of digits, such as four further digits. In general, however, the total number of digits need not be seven, so long as some prescribed subscriber-entered information alerts the telephone company central office not to make a physical connection between the telephone subscriber and whatever location is identified by the code which follows the reserved block of codes which follows the NNX (or *85 signal). After dialing the NNX number, for example, the cable subscriber will provide further information on the telephone by sending illustratively four digits. Hence the telephone transmission to the central office may take the following form: NNX-YVVZ. In this illustrative example, the code represented by NNX activates the ANI passing system at the central office. The remaining four digits YVVZ identify what the subscriber wants to do. Illustratively, the Y digit is used to identify the cable company. In any given metropolitan area, there will be fewer than ten different cable operators, so the one digit (Y) will be able to identify the cable operator uniquely. Illustratively, the next two digits represented by VV identify the event or cable television program which the cable subscriber wishes to purchase. Next, the Z digit may represent a password which is useful for security purposes. For example, within a given household where a cable television system has been installed, parents may, through the use of a password, prevent access by children to certain types of pay per view programming. Alternatively, the Z digit can be used for other purposes. In using *85, five digits can be entered by the cable subscriber to his telephone, for a total of, for example, seven digits preceded by one special character. One of the digits may identify the cable company, two of the digits may identify the cable event to be purchased (or canceled), and two digits may be used as a password. It will be understood that these are purely illustrative, and that wide variation can oc-

As mentioned, the NNX or *85 message tells the telephone central office that it need not make a physical connection. This avoids overburdening the telephone plant. In response to receiving such an ANI transmission, the receiving telephone central office will collect and store data. Then, it will communicate by the system of the present invention with the cable headend station which has been ∓telephoned" and provide it with various information, including the telephone number of the cable subscribers who called, the user entered data, and various other information. In an area served by plural cable companies, the equipment at the telephone company central offices will send data, using the present invention, to the plural cable companies.

The object of the present invention is to provide a system which will receive information from the telephone company central offices and implement the impulse pay per view requests by cable subscribers in a satisfactory manner.

A related object of the invention is to provide a system having the ability to receive data from the telephone companies as fast as the information can be provided using the ANI passing systems.

Another object of the present invention is to permit 5 the authorizations of the subscribers to be checked in real time.

A further object is to translate the telephone number of the cable subscriber (provided by the telephone company) into a cable subscriber code at a fast rate.

BRIEF DESCRIPTION OF THE DRAWINGS

In describing the various aspects of the present invention, reference will be made to the accompanying drawings wherein:

FIG. 1 is a block diagram of a system according to the present invention showing plural central offices and a headend station;

FIG. 2 is a block diagram of one of the several telephone communication units (TCUs);

FIG. 3 is a flow chart of the TCU software;

FIGS. 4A and 4B are diagrams of the telephone communication controller (TCC) located at the cable headend station, and FIG. 4C is a flow chart of part of the TCC operations pertaining to adaptive window multiplexing;

FIG. 5 is a flow chart of the TCC software; FIGS. 6A, 6B and 6C are diagrams of the multiplexer

FIG. 7 describes the inputting of data to the multi-30 plexer from the TCC;

FIG. 8 describes the outputting of data from the multiplexer to the system controller;

FIG. 9 shows the message format of the data sent from the multiplexer to the system controller;

FIG. 10 shows the phase inverted synchronous inputoutput buffer system used in the system controller;

FIG. 11 is a sketch illustrating processing by the system controller, CATV encoder, and billing computer:

FIG. 12 is a sketch showing the two level searching used in the mapping algorithm applied in the system controller; and

FIG. 13 illustrates further how the four words sent to the system controller are processed.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows a block diagram of a system according to the present invention. The preferred embodiment of 50 the invention is the Zenith PHONEVISION system. As shown, the system comprises a plurality of telephone communication units (TCUs) 20 each located at a corresponding telephone company central office 22. Several central offices 22 are shown in FIG. 1 to indicate the 55 several central offices of any metropolitan area. In the preferred embodiment of the present invention there may be as many as sixteen central offices. Also located at the telephone company central office is an automatic number identification (ANI) computer 24. The ANI 60 computer is provided by the phone company and is activated upon receipt of a telephone call from a customer utilizing a special ANI telephone code. The ANI computer then provides specific information to its TCU on a cable 26.

Coupled to each telephone communication unit 20 is a corresponding modem 30. Modems 30 are coupled via leased telephone lines 32 or other communication chan-

nels to corresponding modems 34 located at a cable headend station 36. Each modem 34 is coupled by a cable 38 to a respective telephone communication controller (TCC) 40. The TCCs 40 are in turn coupled to a multiplexer 42 by a bus 44. Multiplexer 42 selects which one of the TCCs corresponding to the various telephone company central offices will supply data to a system controller 46. The system controller in turn is coupled to a cable TV encoder 48 as well as a billing 10 computer 50.

In order to utilize the impulse pay per view system of the preferred embodiment described herein, a cable television subscriber would tune his addressable cable television decoder to the desired channel. The cable subscriber would then use his telephone to enter the ANI telephone code and then four or more digits. Two of the digits entered by the cable subscriber signify the particular IPPV cable event the subscriber wishes to view. Two of the other digits for illustrative purposes constitute a password number or could be used to identify which of a plurality of encoder units the subscriber wishes to enable for the desired cable event.

The telephone company central office 22 serving the cable subscriber's telephone area will be alerted by the ANI code so that when it receives the call, it will transform the "dialed" phone number (called the "destination telephone number") and other data into the socalled bulk calling line identification (BCLID) format by using the ANI computer. It will be understood that other protocols can be used by the telephone company, and that the present invention is not limited to the specific protocol adopted. In any event, the telephone company central office will not connect the incoming call from the cable subscriber to its local switch. Thus, the telephone company central offices will not become overburdened with the incoming calls from numerous cable subscribers who may all be calling on impulse to purchase a particular cable event.

The ANI computer at the telephone company central office will send the BCLID data (using seven bit ASCII code) to the TCU 20 located at the central office. The data is sent serially at 1200 baud in RS-232 format. The BCLID message contains ASCII characters representing the seven digit "destination telephone number," the ten digit origination telephone number, as well as considerable other data such as carriage return and line feed, a BCLID input/output message identifier, numerous ASCII spaces, the time of day in hours, minutes and seconds, the terminating line status and the calling line status indicator. The data sent in the telephone company's BCLID format is shown in Table I.

The "destination telephone number" carries the information entered by the cable subscriber. This will include the cable event which is to be purchased and the password. Ordinarily, this will comprise the last four of the seven digits entered by the subscriber, although any number of digits could be entered, and of these, any number could be dedicated to identifying the program to be purchased, a password, an identifier of which particular converter box at the subscriber's premises is to be used, and any other information deemed necessary or desirable by the cable company.

TABLE I

Format of BCLID Message Sent By ANI Computer 24 to TCU 20

<cr-lf>BCsaabbccssdddddddsooooooooosfsgs<cr-lf>

<cr-lf>

All messages start and stop with carriage

the feet of the fe

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		Format of BCLID Message Sent y ANI Computer 24 to TCU 20	
	BC s aa bb cc ddddddd ooooooooo f	return line feed BCLID I/O message identifier ASCII "space" Hours (24 hour format) Minutes Seconds 7-digit "destination telephone number" I0-digit origination telephone number Terminating line busy, idle status, ("0" = idle, "1" = busy) Calling line DN multi-status indicator	

This data is sent by the ANI computer 24 to its corre- 15 sponding TCU 20 asynchronously without handshaking, and can be a continual data stream.

The TCU 20 must be able to receive and transmit the data as fast as the ANI computer 24 can send it. To promote speed, each TCU 20 strips away unneeded data 20 and temporarily stores the remaining data in a buffer. The stored data is then transmitted synchronously to the cable headend station using a telephone line 32. Preferably, a contracted synchronous data link control (SDLC) protocol is used for transmitting the data from 25 each TCU 20 to its corresponding TCC 40 at the cable headend station. After the data has been transmitted to the headed station, the TCU 20 waits for an acknowledgement message from the headend TCC 40 before transmitting the next data packet. If no acknowledge- 30 protocol which is reflected in Appendix I. Briefly, howment or a negative acknowledgement message is received, TCU 20 retransmits the previously transmitted data packet. The TCU 20 provides for error free transmission to TCC 40 with no data loss. Since much of the unnecessary information of Table I is removed, as will 35 be described, by the TCU 20, and due to the buffering occurring at each TCU 20, each TCU 20 is able to operate at a rate fast enough to keep up with ANI computer 24. Each TCU 20 also provides for conversion of the BCLID data received from the phone company to 40 the modified SDLC protocol format.

A block diagram of a TCU 20 located at one of the telephone central offices is shown in FIG. 2. It includes an Intel 8085 central processing unit ("CPU") 52, a $4K \times 8$ static RAM 53, a $16K \times 8$ EPROM 54, a $4K \times 8$ 45 EPROM 55, two Intel 8250 Asynchronous Communication Elements 56, 57, an Intel 8273 programmable HDLC/SDLC protocol controller 58, chip select logic 59 and watchdog reset circuitry 60. A sixteen bit address and eight bit data bus 61 provide communication 50 among the various components of TCU 20. The serial data from the telephone office ANI computer 24 is applied to a serial data input pin of communication element 57 by a line 62 which is coupled to cable 26 through a line receiver (not shown). The equipment on 55 this board, according to the preferred embodiment, has two asynchronous channels and one synchronous chan-

The CPU 52 in the preferred embodiment illustratively operates at four megahertz. Its instruction code is 60 stored in EPROM 54. The EPROM 55 may contain look-up tables. RAM 53 is used to buffer data packets, for stack purposes and for program use. Chip select logic 59 is used to determine whether the read or write operation is required of the memory mapped devices 65. and to determine the exact device being addressed.

As mentioned, once the data from the telephone office ANI computer 24 is received, TCU 20 strips away

unwanted data. The data that is kept is the seven digit (illustratively) "destination telephone number" entered by the cable subscriber (which includes the data the cable event to be purchased), the ten digit phone number of the cable subscriber, the terminating line status and the calling line indicator. These nineteen characters are ASCII characters, and are temporarily stored or buffered in RAM 53 to await transmission to the corre-'sponding TCC 40 at cable headend station 36.

FIG. 3 contains a flow chart of the software which controls the inputting of data from the telephone office ANI computer 24 and the outputting of data to the cable headend TCC 40. A listing of the TCU software is contained in Appendix I. Referring to FIG. 3, after data is received from ANI computer 24 at block 64, unwanted data is stripped, temporarily stored, and then sent in packets to the headend unit as shown at blocks 65, 66 and 67. Then TCU 20 determines at decision diamonds 68 and 69 whether a positive acknowledgment has been received from the headend. If not, retransmission of the data packet occurs, as indicated by route 70. If there is stored data in RAM 53, determined at diamond 71, further data packets are sent to the headend, as indicated by route 72. Otherwise, data continues to be received, as always, and put into a buffer (RAM) until processed.

The nineteen ASCII characters sent by TCU 20 to its TCC 40 are sent via a line using a contracted SDLC ever, the SDLC protocol is modified to preserve the package format, zero bit insertions, and the frame check sequence ("FCS code"), with all else eliminated. The data is sent synchronously, serially, at 1200 baud, and is RS-232 compatible. Handshaking is used, so that for every packet sent from the TCU 20, a positive acknowledgment is required in the preferred embodiment before the next packet is transmitted. Table II shows the illustrative message format of the data sent from a TCU 20 to its TCC 40. Table III shows the illustrative acknowledgment message sent from a TCC 40 to its corresponding TCU 20.

TABLE II

Me	ssage	Ser	it Fr	om
The 7	rcu	To '	The	TCC

[address] [packet ID]NNXDDDDAAACCCCLLLYZ[FCS]

[] denotes an 8-bit quantity address = FF hex

NNX = ANI identifier, e.g., *85 or 1st 3 digits of

destination phone no. D = User data

A = Area Code
C = First 4-digits of subscriber's phone number

L = Last 3-digits of subscriber's phone number

Y = Terminating line status (line busy or not)

Z = Calling line indicator (public line or private

branch exchange) [FCS] = Frame check sequence for error checking

TABLE III

Acknowledgment Message Sent From The TCC 40 To The TCU 20

[address] [packet ID] [acknowledgment byte] [FCS] FCS]

acknowledgment byte = C3 hex for NACK

= A5 hex for ACK

[] denotes an 8-bit quantity

It will be understood that these processes occur at each of the several central offices of the telephone company serving the cable companies areas. The system as described so far collects data in real time. The collected data are the requests of subscribers, and this is achieved 5 using a system compatible with ANI passing. Data is sent from multiple telephone central offices to a cable headend station. The data provided includes the subscriber's telephone number and his request, which is couched in the destination telephone number.

Turning now to the cable headend station 36, the basic functions of each TCC 40 in the preferred embodiment are to receive data packets from the several telephone central offices 22, store the data temporarily, perform some conversions into binary and BCD, refor- 15 mat the data, and communicate it quickly to system controller 46 via temporary storage in multiplexer 42. As seen in FIG. 1, there are several TCC units 40 corresponding to the several telephone central offices 22.

A block diagram of an illustrative TCC 40 located at 20 the cable headend station 36 is shown in FIG. 4A. The same components are used in the TCC 40 as in the TCU 20, and in the same configuration. As with TCU 20, this board has asynchronous and synchronous capability. In TCC 40, the synchronous ports of the Intel 8250 chips 25 are used. Each TCC 40 additionally includes a board select and I/O bus control logic circuit 74 shown more particularly in FIG. 4B. This circuitry illustratively comprises two Intel 8255 programmable peripheral interface (PPI) chips represented by 75, an eight bit 30 transceiver 76, a four bit magnitude comparator 77 and a four pole DIP switch 78. Switch 78 is used to set the select address of the particular TCC. For example, the first TCC would have all four poles of the switch arranged so that each outputs a logic "0." The switch 35 outputs are connected to one side of the magnitude comparator, and the other side of the comparator is coupled to four board select lines 79 coupled to multiplexer 42. When comparator 77 sees a match in its two inputted values, it generates a match signal that is input- 40 ted via a serial input data (SID) line 80 to the CPU of FIG. 4A alerting it that the TCC board is being offered the opportunity by multiplexer 42 to output data.

The I/O control logic part of circuit 74 handles the outputting of eight bit parallel data sent to multiplexer 45 42. In order to transfer data from TCC 40 to multiplexer 42, a check is made to ensure that multiplexer 42 is ready to receive a data byte. Then transceiver 76 (FIG. 4B) is enabled by the one of PPI chips 75. The data to be transferred is then written into the same PPI chip. If 50 multiplexer 42 is ready, the data byte is strobed into the multiplexer by performing a write operation. Four bus control lines 81, 82, 83 and 84 (CLEAR/RESET, STOP, FULL, WRITE) are used to check if the multiplexer is ready for data and to strobe the data into the 55 multiplexer.

This process can be referred to as part of what is referred to herein as "adaptive window multiplexing" wherein multiplexer 42 addresses in sequence each of several TCCs 40, any of which may or may not have 60 data to output. However, the time allotted to any one TCC is not fixed, as in conventional multiplexing. For the most part, the time taken by any single TCC 40 depends on how much data, if any, needs to be sent from that TCC 40 to multiplexer 42, subject to limita- 65 tions of the memory used for buffering in the multiplexer, as described infra. Referring to FIG. 4C, multiplexer 42 provides address outputs in sequence. The

CPU on each TCC 40 looks for its own address (i.e. the address of its board) being issued by the multiplexer, as indicated by diamond 85. The CPU will know whether it has any data (stored temporarily in RAM) to send. If there is such data, then when the CPU sees its address issue, it will stop multiplexer 42 from progressing to the address of the next TCC in sequence by bringing the STOP line 82 low, indicated by block 86. A short time later (interposed for example by the execution of a few instructions), the CPU ON TCC 40 checks to make sure that the address at which multiplexer 42 did stop is indeed the address of this particular TCC 40 (diamond 87). If so, then the CPU will cause a fast data transfer (at a rate of 56K bytes/sec) to the multiplexer (block 88, 89, 90). If the address is wrong, then the CPU will release STOP line 82, and thereby multiplexer 42, and not send data (block 91). This is a double check to ensure that only one TCC 40 sends data to the multiplexer 42 connected to bus 44. In FIG. 4B, bus 44 comprises lines 79 and 81 to 84.

As stated, each TCC 40 has circuitry 74 not included in any of the TCUs 20. While each TCC 40 uses different software than the TCUs, both the TCU and the TCC program is stored in the 16K×8 EPROM, and the 4K×8 RAM is used to buffer data, for stack purposes and for program use. The RAM has a portion which is used as an input buffer and another portion used as an output buffer. A flow chart of the software used in the TCC of FIG. 4A is shown in FIG. 5. A listing of the TCC software is contained in Appendix II.

An important function of each TCC 40 in the preferred embodiment is to convert the ASCII data received from its corresponding TCU 20 into a format more readily usable by the system controller 46, which preferably is a Hewlett-Packard HP-1000 computer. The conversion occurs at block 94 of FIG. 5. The last three digits of the originating phone number (LLL in Table II) are converted into a ten bit binary number. The first four originating digits (CCCC in Table II) are converted into a fourteen bit binary number. The area code of the originating phone number is converted into a two bit binary number (it being assumed that no more than four area code regions are covered by the several telephone central offices which serve the subscribers of the cable operator). The numbers entered by the cable subscriber (DDDD in Table II) representing the cable event and the password are converted into binary coded decimal (BCD) values.

The following example illustrates the novel conversion of a three digit ASCII number to a ten bit binary number. In this example "h" following a number indicates that hexadecimal base is used and "d" indicates that the number is a decimal number. The number to be converted is 0110100 (34h) 0110011 (33h) 0110010 (32h), i.e. 432d. The least significant ASCII digit (i.e., the decimal "2" in the "ones" decimal column) is converted into its binary equivalent by subtracting 30h from the digit: 32-30=02h. The second ASCII digit (the next most significant digit, i.e. the "3" in the "tens" column) is then converted to binary with tens-place weighting. This is converted to binary as in the previous conversion, i.e. 33h-30h=03h. Then the base address of a look-up table stored in an EPROM in TCC 40 for the tens units is added to this value in order to find an address in the look-up table. Then, using this address, a value is obtained from the look-up table. For the number 03h in the tens place, the value read from the lookup table is 1Eh (30d). This is a weighted conversion

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process. The same weighted conversion process is used for the third ASCII digit, but with different weighting. For 04h (34h – 30h) in the hundreds place, the look-up table value is 190h (400d). The hexadecimal values are then combined: 190h+1Eh+02h=1BOh (432d). The 5 conversion process for a four digit ASCII number is similar to the process explained above except, of course, thousands-place weighting is also used.

The following is an example of a conversion of a three digit ASCII value area code to a two bit binary 10 number. In this example "b" following a number indicates that the number is in binary, and again "h" indicates hexadecimal. The area code to be converted is 33 31 32, i.e. 312d. The first ASCII digit is converted into a hexadecimal value by subtracting 30h (32h-30h=02h=00000010b). The second digit is converted the same in (31h-30h=01h=00000001b) and this value is rotated left four places (0000001b→00010000b). The first and second values are then combined, and stored in a regis- 20 of the CPU of the TCC (000000010b+00010000b=00010010b=12h). The third ASCII digit is converted into a hexadecimal value to which the look-up table base address (F0h) is added (33h=30h=03h; 03h+F0h=F3h). The sum value is 25 stored in a CPU register. The first and second register pair (F312h) contains the address where the desired two bit value is found corresponding to the 312 area code.

After the ASCII numbers are converted into the appropriate form, they are stored (block 95 of FIG. 5) in 30 the output buffer portion of the on-board RAM of TCC 40 until multiplexer 42 indicates that it is ready to receive data (indicated at 96). In addition, the data to be sent to the multiplexer is arranged in a particular format by the TCC 40 before it is transferred. This is done so 35 that when the data is eventually sent to system controller 46, it will be able to process the data without excessive manipulation. The format of the data sent to multiplexer 42 is shown in Table IV. As can be seen, the data is transferred (block 97) in eight bytes, each byte having 40 eight bits. Note that byte 1 contains the two bit binary area code data as well as the first six binary bits of the converted last four digits of the originating phone number. Note also that zeros are inserted into a portion of byte 3 and in all eight bits of bytes 5 and 7.

TABLE IV

Data Sent To The Multiplexer From the TCC						
BYTE 1:	[(2-bit area code) (1st 6-bits of CCCC)]					
BYTE 2:	[remaining 8-bits of CCCC]					
BYTE 3:	[000000 (1st 2-bits of LLL)]					
BYTE 4:	[remaining 8-bits of LLL]					
BYTE 5:	[00000000]					
BYTE 6:	[8-bit event #]					
BYTE 7:	[00000000]					
BYTE 8:	[8-bit user pass word]					

C = One of the first 4 digits of subscriber's telephone number (now binary)
L = One of the last 3 digits of subscriber's telephone number (now binary)

Several steps are taken in each TCC 40 to ensure the reliability of data. The system overwrites (block 98) any 60 data which is retransmitted (which can occur when a negative acknowledgment issues) (decided at diamond 99). This avoids excessive data. Note also that in this flow chart, if TCC 40 determines that data is to be received from its TCU 20 (diamond 100) then the TCC 65 will postpone a data transfer, even if data is in the output buffer (decided at diamond 101). Thus, inputting has priority over outputting, to ensure against losing data.

The rationale is that inputted data and data ready for outputting can both be buffered. The data transfer rate on outputting is so high (illustratively 56K bytes/sec) that some delays can be tolerated to allow for inputting.

A block diagram of the preferred embodiment of multiplexer 42 is shown in FIG. 6A. The multiplexer performs three major functions, namely: (1) selecting one of the sixteen possible TCCs to receive data from at any given time, (2) buffering the received data until system controller 46 is ready to receive it, and (3) transferring the buffered data to the system controller.

Multiplexer 42 illustratively comprises two Mostek 4501 first-in, first-out (FIFO) dual port memory chips 102, 103, bus interface control and buffer load logic 104, oscillator and select logic 106, reset circuitry 108, input/output control logic 110 and two output buffers 112 and 114. Data is received from TCC 40 on an eight bit data bus 116 and transmitted to the system controller 46 on a sixteen bit data bus 118.

The oscillator and select logic 106, illustrated further in FIG. 6B, selects which one of the TCC units 40 data is to be received from. This oscillator circuitry may comprise a schmitt-trigger inverter with its output looped back to is input through a low-pass filter to form an 8 KHz oscillator 120 (FIG. 6B). This clock signal is used to perform dummy read operations during a system controller request for reset and to increment a board select counter. The board select counter of circuit 106 is illustratively a four bit binary counter 121 with its Enable control coupled to a single stop line 82 which in turn is coupled to all sixteen of the TCC units 40. Counter 121 continually cycles from 0 to 15 until halted by any of the TCC 40 requesting a data transfer by taking stop line 82 low. Once the data transfer is completed (i.e., the output buffer portion of the RAM in the TCC of the addressed TCC has been emptied), stop line 82 is returned high by such TCC 40, and counter 121 is allowed to resume its counting in order to address the next TCC in sequence. As shown in FIG. 5, if there is no data in the output buffer of the addressed TCC (decision diamond 101), then such TCC will not seize the opportunity to write data onto the eight bit bus 116 (FIG. 6) coupled to multiplexer 42. Instead, such TCC 40 will continue receiving and processing synchronously sent packets of data from its TCU 20 and will permit multiplexer 42 to address the next TCC 40 in sequence. Thus, the length of time or the window during which data is received by the multiplexer from a particular TCC adapts according to the amount of data in the TCC output buffer available at the time for transfer, as part of the adaptive window multiplexing tech-

Bus interface control and buffer load logic 104 is responsible for strobing data from a TCC 40 into the 55 correct FIFO buffer 102 or 103. This circuitry is illustrated in FIG. 6C and inserts all of the odd number bytes, i.e. bytes 1, 3, 5 and 7 received from a TCC 40 into FIFO 102 and all of the even number bytes, i.e. bytes 2, 4, 6 and 8 into FIFO 103.

A flow diagran for multiplexer 42 describing the input of the data from the TCCs is shown in FIG. 7. As counter 121 increments, its output is sent on a four line bus (A0, A1, A2, A3 of FIG. 6B), as indicated at block 130 of FIG. 7. Multiplexer 42 then determines whether STOP line 82 has been brought low, at decision diamond 131, for a requested data transfer. If so, counter 121 is stopped (block 132; see also the logic circuit 133 coupled to the Enable input of counter 121 in

The outputting of data from multiplexer 42 is shown in the flow diagram of FIG. 8. This includes determining whether multiplexer 42 has any temporarily stored data ready for outputting (diamond 136). Also a determination is made as to whether system controller 46 is ready for a transfer (diamond 137).

It should be noted that the inputting of data to multi- 10 plexer 42 is completely independent of the outputting of data from the multiplexer to system controller 46. This allows the telephone central office computers 24 and associated TCUs 20 to operate harmoniously with the system controller 46 at the headend station.

Referring again to FIG. 6A, the input/output control logic 110 performs the handshaking between the multiplexer and the system controller. The handshaking process uses four control lines and corresponding signals: an end of message (EOM) signal on a line 139, a device 20 command (DVCMD) on a line 140, a device flag (DVFLG) on a line 141, and a reset signal on a line 142. Data is transferred from multiplexer 42 to system controller 46 on bus 118 in response to the DVCMD signal, data, and a FIFO empty (FE) line 143 from FIFO 102 indicating that data is available for transfer, i.e., the FIFO is not empty. At that time, a read line 144 to the FIFO is activated as is the DVFLG line 141 to system controller 46. Once three complete words have been 30 transferred to system controller 46, the EOM control line 139 goes high, signalling that the next word to be transferred will be the last word (Word #3).

System controller 46 preferably is an HP-1000 computer, which reads four words at a time. To ensure 35 against loss of data, the reset signal on line 142 (from system controller 46) forces multiplexer 42 to perform dummy reads from FIFO buffers 102, 103 in order to ensure completion of a four packet transfer. The line 139 is detected at which time the reset circuitry 108 is disabled and normal read operations are resumed.

Multiplexer 42 converts the eight 8-bit bytes received from each TCC 40 into four 2-byte words which are sent to the system controller at a rate of up to 2M by- 45 tes/sec. The conversion process is accomplished by combining the data words stored in the odd byte FIFO 102 with the data words stored in the even byte FIFO 103 to produce a single 2 byte (sixteen bit) word. The sixteen bit words are sent to system controller 46 on the 50 bus 118.

FIG. 9 shows the format of the data words sent by multiplexer 42 to controller 46. The first two bits 144 of Word 0 represent the telephone area code of the cable subscriber originating the IPPV call. The area code was 55 converted into the two bit format by a TCC 40. The number CCCC represents the first four digits (excluding the area code) of the cable subscriber's phone number, converted to binary by the TCC. The three Xs shown in Word 0 and the four Xs of Word 1 are used only to 60 indicate the place of the numbers. The number LLL in Word 1 represents the last three digits of the cable subscriber's phone number, but in binary form. The event 145 and password 146 in Words 2 and 3, respectively, are the numbers entered by the cable subscriber to se- 65 lect a particular cable event. These numbers were converted to BCD (binary coded decimal) by the TCC 40 which processed the data.

By comparing the data format in FIG. 9 with Table IV, it can be seen that Word 0 sent from the multiplexer 42 to the system controller 46 is made up of bytes 1 and 2 sent to the multiplexer from TCC 40. Likewise, Word 1 is made from bytes 3 and 4, Word 2 is made from bytes 5 and 6, and Word 3 is made from bytes 7 and 8. The data sent to system controller 46 is sent in the format shown in FIG. 9 so that the system controller can process the information without extra manipulation. This speeds up the rate at which a cable subscriber's one-way addressable converter is authorized after the subscriber places an IPPV call.

System controller 46 processes the four sixteen bit words of FIG. 9 to identify the cable subscriber, find 15 the subscriber's decoder address, and change the decoder authorization to allow viewing of the program selected by the subscriber (or to implement a cancellation at the subscriber's request). The system controller also initiates proper billing of the transaction by sending information to billing computer 50.

The four words sent to the system controller are sent directly to the buffer memory of the controller using direct memory access (DMA). In order to process the data sent to it at the fastest possible rate, system controlmeaning that system controller 46 is ready to receive 25 ler 46 employs a phase inverted synchronous input/output process using four buffers, two for input and two for output. FIG. 10 show a diagram of this buffer system. While an input buffer 147 is receiving data from multiplexer 42, an output buffer 148 is outputting data to the cable TV encoder 48 or the billing computer 50. Concurrently, data from an input buffer 149 is being processed and sent to an output buffer 150. These concurrent processes are represented by the solid and broken lines in FIG. 10. When the data in input buffer 149 is exhausted, output buffer 150 receives data from other sources until it becomes filled. During this time, output buffer 148 continues to output data. When buffer 148 no longer has data to output, system controller 46 is interrupted, and the buffer arrangement is inverted. The dummy reads are performed until the EOM signal on 40 inputting, outputting and processing after the interrupt is shown by the broken lines in FIG. 10. After the interrupt, data is inputted into input buffer 149; output buffer 150 sends data to cable TV encoder 48 or billing computer 50; and data from input buffer 147 is processed and sent to output buffer 148. This alternating process is continually repeated to ensure that processor 46 does not waste time waiting for data to be inputted or outputted.

> As mentioned, system controller 46 processes the four words sent to it by multiplexer 42 to locate ("map") the address of the one-way addressable converter for the cable subscriber initiating the IPPV call, to check the password entered by the cable subscriber and to change the authorization code in the cable subscriber's converter in order to allow him to view the cable event. FIG. 11 is a diagram which should be helpful to understand the processing which occurs at system controller 46, addressable CATV encoder 48 and billing computer 50. Data from multiplexer 42 is applied to one of the input buffers of FIG. 10 which is represented as a buffer 151 in FIG. 11 receiving an input via line 152. The inputs comprise the four words depicted in FIG. 9. These four words are used to determine the action which is to occur. Words 0, 1 and 3 are used to map the telephone number of the subscriber into the address code of his converter, as shown at 154. Referring back to FIG. 9, it will be seen that Word 0 comprises the area code and part of the telephone number of the sub-

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scriber, and Word 1 completes the telephone number of the subscriber. At 154, system controller 46 finishes mapping the telephone number to the unique address code of the converter of the cable subscriber. Word 3 is used to make sure that the password is valid or, alternatively, to determine which of several converters are to be authorized at the premises of the cable subscriber. In this mapping function, system controller 46 refers to a data base 156, discussed infra. In the event that system controller 46 cannot map the telephone number into a 10 converter code (because, for example, of a wrongfully dialed telephone number), an error is generated at 158. That error can also be generated if the data base reflects the unavailability of the event for purchase by that particular subscriber, because of bad credit, tardy bill 15 payments, or whatever reasons are considered to be adequate by the cable company.

Word 2 of FIG. 9 identifies the cable event which the cable subscriber wishes to purchase or to cancel. Word 2 is applied at 160 to determine the action which is 20 requested by the subscriber. The system provides for the subscriber to either request a pay per view cable event or, if he wishes, to cancel it within a prescribed time. Referring to a schedule 162, the determination is made as to whether the cable event is requested to be 25 turned on or off. If no such cable event is found in the schedule 162, an error 164 will be generated. Assuming that there are no errors in the determinations 154 or 160, then an authorization to program the cable subscriber's converter as well as a program tag and a program iden- 30 tification are provided to an output 166. From there, the information is provided to an output buffer 168 which holds information until the CATV encoder 48 processes

In addition, from the output 166 information includ- 35 ing the converter indentification, the program identification, and a timestamp are posted to a disk at 170 within system controller 46. Subsequently, these postings are unloaded to billing computer 50, typically on the next business day. Billing computer 50 had editing 40 capabilities via a line 172 with data base 156. Thus, if desired by the cable company, the billing computer can edit the data base so that no cable subscriber can exceed some limitation per month on cable pay per view events. Also, the system can provide in this manner for 45 preventing any pay per view events from being purchased by a cable subscriber while permitting normal cable operation. This will be determined by the policy of the cable company, but the present system provides the flexibility to achieve all objectives of the cable com- 50 pany. FIG. 12 further illustrates the mapping process occurring in system controller 46. To map the telephone number of the subscriber into an authorization code, system controller 46 preferably uses a two level tree having a root and many leaves. In the preferred 55 system, a root corresponds to one page of memory (which is 1024 words, each 16 bits) and each leaf also is one page of memory. The root uses table searching. Thus, in FIG. 12, Word 0 is used to search the root at 180. The root usually has between 10 and 50 entries, 60 which corresponds to the fact that the first four digits of a seven digit telephone number used by the telephone company occur in selected groups. In other words, there is a limitation used by the telephone company so that although four digits are used, there are fewer than 65 10,000 numbers which are actually assigned, although 10,000 are theoretically possible. This root is sometimes referred to as the PHIN root, standing for "phone in-

dex." In the event that the searching at 180 does not locate the number which has been specififed by Word 0, than an error is indicated as shown at 182. However, if the root is found at 180, then Word 1 is used to search the leaf at 184. The leaf has many parts, the Word 1 is used to arrive at a correct pointer stored in the leaf. This method is referred to as direct indexing by persons skilled in the art, and is a time efficient method. The pointer will lead to the correct information for the converter of the cable subscriber who telephoned his request. In the event that the direct indexing does not locate the pointer, then an error is indicated at 186. If the pointer is found, then Word 3 is used to check the password at 188. If the password matches, then authorization can be provided at 190. If, however, the password does not match, then an error will issue at 192.

FIG. 13 illustrates the processing of the four words of FIG. 9 more particularly. Word 0 at block 200, containing the two bit area code and the fourteen bit number group corresponding to the first four digits of the cable subscriber's telephone number, is used to locate within a phone index (PHIN) root 202 one of several leaves 204. Word 1 at block 206 containing the ten bits corresponding to the last three digits of the cable subscriber's telephone number is used to find the particular slot in the phone index leaf 204 containing a pointer to the unique data of interest. This points to a block 208 which contains the home unit control block (HUCB) comprising the cable subscriber's one-way addressable converter address, the current authorization code for the cable subscriber, a password and an IPPV flag. The password is then read from the home unit control block and compared at block 210 with the password contained in Word 3 which is represented by block 212. If the two passwords match, the home unit control block authorization bits are then updated at block 214 with the event number contained in Word 2 (in block 216). The new home unit control block information is then sent out to the cable subscriber's converter so that the converter will be enabled, thus allowing the viewer to view the program selected by the IPPV call. System controller 46 also downloads the necessary information to billing computer 50 so that the cable subscriber will be billed for the IPPV event.

Thus, it will be appreciated that at the cable headend station, data from multiple telephone offices are gathered, mapped into addresses and converter authorization codes (provided no errors are found), posted for billing purposes; and encoded for nearly instant updating. The mapping for each request preferably occurs in more than one step at plural locations, so the burden on the system controller is eased. As described herein, each TCC 40 converts ASCII characters for received phone numbers into binary data, and converts the ASCII characters identifying the PPV event to be purchased as well as the password into BCD. At the system controller, these data are mapped fully into converter addresses and program tags.

By the system of the present invention, there is provided a system for accepting impulses purchases from cable subscribers who do not have two-way cable TV systems. The described system is compatible with ANI passing, and accepts information provided by the telephone office ANI computer as fast as the computer can supply it. The data is automatically translated into a form usable by the system controller and communicated at a fast rate. Appropriate error checking occurs along the entire stream of data flow to ensure reliability. The

requests of the cable subscribers are checked in real time, and barring any reason to forbear, the cable subscriber's cable TV addressable converter is authorized to allow the subscriber to view or cancel the cable event as desired. After the cable event is completed, the system controller clears the data base of the authorizations.

It will be appreciated from the foregoing discussion that the device at the subscriber premises, which has been variously described as a "converter," "converter

box," or "decoder," and which has been said to be able to descramble signals, may generally be referred to as an "access terminal unit."

It will be apparent that numerous modifications can be made within the scope of the present invention. The arrangement described herein is illustrative, and the scope of protection is indicated by reference to the following claims.

LOC OBJ

9000

9000

9001 9003

9001

9605

4000

4000

6000

6000

6001

6001

6002

6003

4FA0

4FA2

7000

B000

4FA4

FFOC

4FA5

4FA6

4FA7

4FAC

4FAC

4FAD

4FB0

4FB1

4FB2

4F83

4FB5

45 STATUS EQU

46 CURRENT EQU

EQU

47 PTINP

4FB2H

4FB3H

4FB5H

LINE

SOURCE STATEMENT

```
2;
         COPYRIGHT 1985 ZENITH ELECTRONICS CORP.
 3; THIS PROGRAM WAS WRITTEN BY GORDON E. REICHARD ON 6/24/85.
 4; THIS PROGRAM IS CALLED TCU200, ALSO REFERRED TO AS I-TCU200.
 5; THE PROGRAM PERFORMS THE FUNCTION OF RECEIVING SERIAL DATA FROM
 6; THE TELEPHONE COMPANY'S COMPUTER; STRIP AWAY UNWANTED DATA, AND
 7; TRANSHIT REMAINING DATA TO HEADEND.
  12; BEOW ARE THE EQUATE STATEMENTS USED TO ASSIGN LABELS TO
13 ; HEXIDECIMAL VALUES.
15
17 ADATA
                9000H
                              ; ASYNC DATA PORT; 8250
18 BAUDLS
         EQU
                ADATA
                              LSB OF BAUD RATE
19 BAUDHS
                ADATA+1
                              INSB OF BAUD RATE
20 LCR
         EQU
                ADATA+3
                              ILINE CONTROL REG. 8250
21 DISING EDU
                ADATA+1
                              DISABLE INTERRUPT REG. 8250
                ADATA+5
                              ASYNC STATUS PORT, 8250
22 ASTAT
         EQU
23 RAN
         EQU
                4000H
24 BUFFER EQU
                RAH
                              IN AND OUT BUFFER
25 SCHDRG
                              SYNC COMMAND REG. 8273
         EDU
                4000H
                              SYNC STATUS REG. 8273
26 SSTAT
         EQU
                SCHDRG
27 SPRMR6
         EDU
                SCHORG+1
                              ; SYNC PARAMETER REG.
28 RESULT
         EDU
                SPRMAG
                             * ; RESULT REGISTER
29 TXIR
         EQU
                SCHDR6+2
                              ;TRANSMIT INTERRUPT REG.
                              ; RECEIVER INTERRUPT REG.
30 RYIR
         EQU
                SCMDR6+3
                              ; OUTPUT POINTER
31 POINTO
         EOU
                4FAOH
                              ; INPUT POINTER
32 POINTI
         EQU
                POINTO+2
33 SDATAO EQU
                7000H
                              SYNC DATA OUTPUT, 8273
                              ;SYNC DATA INPUT, 8273
34 SDATAI EQU
                OB000H
                              ; INCOMING DATA PACKET PENDING
35 INCOME EQU
                POINTI+2
                              :B AND C COUNTERS
36 COUNTS
         E₽U
                OFFOCH
                              CURRENT 8273 X-MIT STATUS
37 TXSTAT EQU
                POINTI+3
38 ACKFLG
                              ;ACKNOWLEDGEMENT FLAG
         EQU
                POINTI+4
39 XHIT
         EQU
                POINTI+5
                              START ADDRESS OF X-MIT SET-UP
                              CONTROL FIELD FOR SDLC FRAME
40 CNTRL
         ۯU
                XMIT+5
                              PACKET ID NUMBER RAM LOCATION
41 ID
         EQU
                CNTRL
                              ; PACKETS RENAINING IN RAH
42 PACKET EQU
                POINTIZ+11
                             ; MEN. LOCATION OF TIME-OUT COUNTER
43 ACKBYT EQU
                4FB0H
44 CRTBUF
                4FB1H.
                              ; DATA HERE IS OUTPUT TO CRT
         EQU
```

STATUS BYTE READ FROM 8273

CURRENT OUTPUT POINTER (ALSO 4FB4H)

FRIGID INPUT POINTER, INCREMENTS OF 13H

	4F87		48	TIME	EQU	4FB7H	TIME OUT COUNTER	
	E000			RESET	EQU	0E000H	; WATCH DOB RESET CIRCUIT ADDRESS	
			50		;	72.74	,	
			51					
					,,,,,,,,			
							N OF REGISTERS AND CHIPS.	,,
			55		_	,,,,,,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	11
			56		j		v	
	0000		57		; Org	0000Н	1	
	0000		58			0000n		
					DI	A 1011	APMANIA THERMOTE T & AME ! P	
		3E19	59		MVI	A, 19H	; ENABLE INTERRUPTS, 7.5 AND 6.5	
	0003		60		SIM		SET INTERRUPT MASK	
1		210040	61		LXI	H,RAM	SET ALL POINTERS TO TOP OF RAM	
2		22834F	62		SHLD	CURRENT		
•		22A24F	63		SHLD	POINTI	,	
		22A04F	64		SHLD	POINTO		
		22B54F	65		SHLD	PTINP		
	0013	C34006 ,	66	,	JMP	BEGIN		
,			67		;			•
	0020		68		ORG	002CH	;RST 5.5.	
	0020	C30502	69		JMP	BETACK		
			70		;		•	
	0034	•	71		ORG	0034H	RST 4.5	
	0034	C28E01	.72		JMP	DUTDAT .		
			73		;		•	
	0030		74		DRG	003CH	;RST 7.5	
		C31FC1	75		JMP	DATAIN	,	
			76		;			
	0040		77		ORS	0040H	BEGINNING OF MAIN PROGRAM	
		310050		BEGIN:	FXI	SP,5000H	SET STACK POINTER TO TOF	
			79		CYLL	182501	; INITIALIZE 8250. ICI	
		CD1763	80		CALL	182502	JIMITTACITE 0250. ICI	
		CDF802	81		CALL	18273		
		CD9E02	82		CALL	IXMIT	LOFT US DUTBUT ADDAY	
	004F		83				SET-UP OUTPUT ARRAY	•
					MVI	A, OCH	HEADER COUNT	
		32A44F	84		STA	INCOKE	STORE HEADER COUNT	
		JE00	85		HVI	A, 00H		
		32AD4F	86		STA	PACKET	; ZERO PACKET COUNT	
	0057	32AC4F	87		STA	ID .	RESET ID NUMBER	
			88		1		•	
			89		;			
							(4(1)1111111111111111111111111111111111	ii
							HE MAIN BODY OF THE PROGRAM.	
			92	;;;;;;;	;;;;;;;;	;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;		;;
			93		i			
		-	94		i	•	* .	
		JEFF		HAIN:	IVM	A,OFFH	ISET FLAG, NO ACKNOLEDGES EXPECTED	
		32A64F -	96		STA	ACKFL6		
		2AA24F	97		LHLD	POINTI	;LOAD HL WITH INPUT POINTER	
	0054	CDCA00	98		CALL	HL00k	; GET INPUT DATA PACKET ONLY	
	0067	CD7901,	-99		CALL	UP13	JINCREMENT INPUT POINTERS TO NEXT I	NPUT BLOCK
	4400	3E0C	100		MVI	A,OCH	SET-UP INCOME COUNTER FOR NEXT DAT	
	0060	32844F 1	101		STA	INCORE		
	00eF		102		MVI	A,01H	SINCE ONE PACKET HAS BEEN RECEIVED	i
			103		STA		SET PACKET COUNT EQUAL TO 1	
	0074			TXSTRT:			DISABLE INTERRUPTS	
	- • •	-		- nwiitla	٠.		INTODUCE INTODUCTS	

00DF 32A44F

161

STA

INCOME

```
24
```

```
: GET HEADS F CONTIN
                                   INCOME
00EZ 3AA44F
                162 HLOOK2: LDA
                                                  ISEE IF HEALT EXLLES
00ES A7
                163
                            ANA
                                   A
                                                  ; IF NOT, BET 1914
                                   DLOOP
00E6 CAFC00
                164
                            JZ
00E9 47
                165
                            VOK
                                   B,A
                                                  ;ELSE, PUT COUNT INTO REG. B
00EA 3A0590
                166 AGAIN:
                           LDA.
                                   ASTAT
                                                  GET STATUS FROM 8250
00ED E601
                167
                            ANI
                                   01H
                                                  MASK TO GET DR FLAG
00EF 3200E0
                168
                           STA
                                   RESET
                                                  HIT RESET CIRCUITRY
00F2 CAEA00
                169
                            JZ
                                   AGAIN
                                                  ; IF NO DATA READY, LOOK AGAIN
                170
00F5 3A0090
                171
                           LDA
                                   ADATA
                                                  FREAD CHARACTER TO RESET DR
00F8 05
                172
                            DCR
                                                  ; DECREMENT HEADER COUNTER
00F7 C2EA00
                173
                            JNZ
                                   AGAIN
                174
                177 ; LOOK FOR DATA, HEADER ALREADY REMOVED.
                178;
                '00FC 3A0590
                180 DLOOK: LDA
                                   ASTAT
                                                  ;GET 8250 STATUS
00FF E601
                181
                            ANI
                                   01H
0101 3200E0
                182
                            STA
                                   RESET
                                                  HIT RESET CIRCUITRY
0104 CAFC00
                183
                                   DLOCK
                                                  ; IF NO DATA AVAILABLE, WAIT
                            JI
0107 3A0090
                                   ADATA
                                                  ; SET DATA BYTE
                184 INP:
                            LDA
010A FE20
                            CPI
                                   20H
                                                  ; IS IT A SPACE
                185
OLOC CAFCOO
                186
                            17
                                   DLOOK
                                                  '; IF SO, GET NEXT BYTE
010F J20080
                187
                            STA
                                   HOCO8
                                                  ; OUTPUT TO CRT
                188
                            CPI
                                   HGO
0112 FEOD
                                                  ; IS IT A CR
0114 CAFC00
                187
                                   DLOOK
                                                  ; IF SO, GET NEXT BYTE
                            JΖ
0117 FE0A
                190
                            CPI
                                   OAH
                                                  ; IS DATA A LF
0119 CS
                191
                            RZ
                                                  IF SO, PACKET COMPLETE
011A 77
                192
                            KOV
                                                  ; IF NOT, STORE DATA IN RAM
                                   H,A
011B 23
                193
                            INX
                                   Н
                                                  ; INCREMENT INPUT POINTER
011C C3FC00
                194
                            JMP
                                   DLOOK
                                                 ";GET NEXT DATA BYTE
                196; THIS ROUTINE INPUTS DATA, ELIMINATES THE PACKET HEADER AND
                197; STORES THE DATA IN RAM. INPUT FROM 8250.
                199
                200
                201 DATAIN: PUSH
011F F5
                                                  ;SAVE CPÚ STATUS WORD
                                   PS#
0120 3E10
                202
                            IVI
                                   A, 10H
                                                  RESET RST 7.5
0122 30
                203
                           SIN
0123 2AA24F
                204
                           LHLD
                                   POINTI
                                                  ;GET CURRENT. INPUT POINTER
0126 3A0590
                205
                            LDA
                                   ASTAT
                                                  GET STATUS FROM 8250
0129 E601
                206
                           ANI
                                   01H
                                                  ; IS THERE INPUT DATA PENDING
0125 CA7701
                207
                            JZ
                                   RETFLG
                                                  ; IF NOT, RETURN
012E 3AA44F
                208 INPUTD: LDA
                                   INCOME
                                                  ; ELSE DATA IS PRESENT, SEE IF HEADER
                207
                                                  ; IS STILL PRESENT
0131 A7
                210
                           ANA
                                                  ; IS IT ZERO
0132 CA3E01
                211
                            JΖ
                                   DIN
                                                  ; IS SO, VALID DATA IS PRESENT, GET IT
6135 3D
                212 -
                           DCR
                                   A
                                                  ;ELSE, DECREMENT COUNT
0136 32A44F
                213
                           STA
                                   INCOME
                                                  STORE HEADER COUNT
                                                  :00 A DUMMY READ TO CLEAR INTERRUPT
0139 3A0093
                214
                           LDA
                                   ADATA
013C F1
                215
                           POP
                                   PS#
                                                  RESTORE CPU STATUS WORD
013B C9
                215
                           RET
                217 DIN:
013E 3A0099
                           LDA
                                                  ;GET DATA EYTE
                                   ADATA
```

The second secon

,

```
26
                      25
                           CPI
                                                HIS IT A SE-IE .
                                  20H
0141 FE20
                213
                           37
                                  RETFLG
0140 CA7701
                219
0146 320080
                           STA
                                  8000H
                                                 COUTPUT TO CRT
                220
                                                 ; IS IT A CR
                           CPL
                                  HQO
0149 FEOD
                221
                222
                                  RETFLG
014B CA7701
                           JΖ
                223
                           CPI
                                                 IS IT A LF
014E FEOA
                                  HAO
                                  INDONE
                                                 ; IF SO, INPUT PACKET COMPLETE
0150 CA5A01
                224
                           JZ
                                                 JELSE, VALID DATA, STORE IN RAM
0153 77
                225
                           HOV
                                  M, A
0154 23
                226
                           INX
                                                 STORE UPDATED INPUT POINTER
                           SHLD
                                  POINTI
0155 22A24F
                227
                           POP
                                  PSW
                                                 RESTORE FLAGS
0158 F1
                228
                229
0159 C9
                           RET
                                                 FRESET HEADER COUNT
015A 3E0C
                .230 INDONE: HVI
                                  A, OCH
                                  INCOME
                231
                           STA
015C 32A44F
                                                 ;GET CURRENT PACKET- COUNT
                                  PACKET
015F 3AAD4F
                232
                           LDA
                                                 ; HAS MAX. PACKET COUNT BEEN REACHED
                233
                           CPI
                                  ODOH
0162 FEB0
                                  RETRES
                                                 ; IF SO, RESET INPUT POINTERS AND RETURN
0164 CA7101
                234
                           JZ
                                                 ; ELSE, INCREMENT PACKET COUNT
                235
                           INR
0167 3C
                                  A
0168 32AD4F
                236
                           STA
                                  PACKET
                                                 STORE NEW VALUE
                           CALL
                                  UP13
                                                 ; INCREMENT INPUT POINTERS TO NEXT BLOCK
016B €D7901
                237
                                                FRETURN TO MAIN BODY
016E C37701
                238
                           JMP
                                  RETFLG
                                  PTINP "
                                                 GET CURRENT INPUT BASE POINTER
0171 2AB54F
                239 RETRES: LHLD
                                                 FRESET INPUT POINTER TO OVERWRITE
0174 22A24F
                240
                           SHLD
                                  POINTI
                                                 RESTORE CPU STATUS WORD BEFORE RETURNING
                241 RETFLG: POF
0177 F1
0178 C9
                           RET
                242
                243
                244
                246; THIS ROUTINE INCREMENTS THE IMPUT POINTERS IN INCREMENTS OF 13H. THIS
                247; ROUTINE ALSO INSURES THE POINTERS ARE IN BUFFER RANGE.
                249
                250
                251 UP13:
                           HVI
                                  A. 13H
                                                 ; VALUE TO BE INCREMENTED
0179 3E13
                                                 GET LAST BASE INPUT POINTER
                           LHLD
                                  PTINP
0178 2AB54F
                252
                                                 ; INCREMENT TO NEXT INPUT BASE
017E 85
                253
                           ADD
                                  L
                                                 ; PUT INCREMENTED VALUE BACK INTO L
017F 6F
                254
                           YON
                                  L,A
                                               . ; CLEAR A
                255
                           MVI
                                  A, 00H
0180 3E00
                                                 "; ADD CARRY TO RESISTER H
                256
                           ADC
0182 8C
                                                 RESTORE UPDATE VALUE
                257
                           HOV
0183 67
                                  H,A
                                                 ; INSURE POINTERS ARE STILL IN RANGE
                           CALL
                                  OVERFL
0184 CDF901
                258
0187 22B54F
                259
                           SHLD
                                  PTINP
                                                 STORE NEW INPUT POINTERS
                           SHLD
018A 22A24F
                260
                                  POINTI
0180 C9
                261
                           RET
                262
                263
                265; THIS ROUTINE DUTPUTS A SINGLE DATA BYTE TO THE 8273 UPON
                266; REQUEST, THIS ROUTINE ALSO CHECKS FOR TRANSMISSION ERRORS AND
                267; END-OF-MESSAGE INTERRUPTS.
                269
                270
                271
                                                 GET STATUS FROM 8273
018E 3A0050
                272 OUTDAT: LDA
                                  SSTAT
                                                 STORE CURRENT STATUS
0191 32BZ4F
                                  STATUS
                273
                           STA
                                                 : IS THERE AN INTERRUPT RESULT AVAIL.
0194 E601
                           ANI
                                  01H
                274
```

this fam. and the second of th

0200 CO

0201 210040

RNI

LXI--- H. RAM

; IF POINTER IS. 4F70H, RESET TO TOF

330

30

```
OF RAM
                 332
0204 C9
                 333
                             RET
                 334
                             ŝ
                 335
                 337 : THIS ROUTINE INPUTS A DATA BYTE FROM THE 8273, THIS ROUTINE
                 338 : ALSO CHECKS FOR TRANSMISSIONS ERRORS AS WELL AND THE END-
                 339; OF-MESSAGE FLAG.
                 341
                 342
                                                    SET INTERRUPT MASK TO OUTPUT
0205 3E0A
                 343 BETACK: MVI
                                     A.OAH
                                                     ; TO CRT.
0207 30
                 344
                             SIK
                                                     GET STATUS WORD FROM 8273
                 345
                             LDA
                                     SSTAT
0208 3A0050
                                                     STORE STATUS NORD 4
                             STA
                                     STATUS
029B 32B24F
                 346
                                                    ; IS THERE A RECEIVER INTERRUPT RESULT
020E E602
                 347
                                     02H
                                                     ; IF NOT, INPUT DATA IS AVAILABLE
0210 CAB102
                 348
                             JZ
                                     INBYTE
                                                    ; ELSE, READ STATUS BYTE & DETERMINE RESULT
021J JAB24F
                 349
                             LLA
                                     STATUS .
                 350
                             ANI
                                                     ; IS IT AN IMMEDIATE RESULT
0216 E610
                                     10H
021E CA2202
                 351
                             JZ
                                     CONTR
                                                    IF NOT CONTINUE
                                                     ; ELSE, READ RESULT
021B 3A0160
                 352
                             LDA
                                     RESULT
021E 01890A
                 353
                             LXI
                                     B. JAB9H
                                                     ; RESTORE TIME-OUT COUNTER
               354
0221 69
                             RET
               - 355 CONTR:
                             LDA
                                     RXIR
                                                    READ RECEIVER INTERRUPT RESULT
0222 JA0360
                                                    ;SEE IF CRC ERROR HAS OCCURRED
0225 FE03
                356
                             CPI
                                     03H
                                     DATCRC
                                                    FIF SO, DETERMINE TYPE
0227 CA6402
                 357
                             JZ
                                                    ; IS PACKET RECEIVED COMPLETE AND ERROR FREE
                 358
                                     0FK
022A E6GF
                             ANI
                                                    ; IF NOT, GOTO BAD RECEIVE
                 359
                             JNZ
                                     BADR
022C C24E0Z
                                                    ;SET-UP COUNTER TO GET PACKET ID" .
                                     C,04H
                             MVI
022F 0E04
                 360 600DR:
                                                    ; CHECK INTERRUPTS
0231 20
                 361 RL1:
                             RIM
                                                     ; SEE IF INPUT DATA IS AVAILABLE
0232 E640
                 362
                             ANI
                                     40H
                363
                             JNZ
                                                    ; IF SO, PREPARE TO GET DATA BYTE
0234 C25C02
                                     RXCALL
                                                     GET SYNC. STATUS WORD
                 364 RL2:
                             LDA
                                     SSTAT
0237 3A0060
                             ANI
                                                   ; is a result available
                 365
                                     02H
023A E602
                             JΙ
                                                    ; IF NOT, WAIT
023C CA3102
                 366
                                     RL1
023F 3A0360
                 367
                                     RXIR
                                                    ;GET RESULT
0242 OB
                                                    ; DECREMENT COUNTER
                 348
0243 C23102
                 369
                             JNZ
                                     RL1
                                                    ; IF NOT ID BYTE, GET NEXT RESULT
                                                   FILSE IT IS ID, PUT INTO B
0246 47
                 370
                             MOV
                                     B, A
                                                   GET TRANSMITTED ID
0247 3AAC4F
                 37 I
                             LDA
                                     ID
024A BB
                 372
                             CMP
                                                    ; ARE THEY THE SAME
024B CA7302
                 373
                             JZ
                                     GOODTA
                                                    ; IF SO, THE TRANSMISSION WAS RECEIVED
                                                   ;; ELSE, IT WAS NOT PROPERLY RECEIVED
024E 2AA04F
                 374 BADR:
                             LHLD
                                     POINTO
                                                    ; RESET POINTERS TO RETRANSHIT
                             SHLD
0251 22B34F
                 375
                                     CURRENT
                             MAI
                                                    ;SET NO ACK. FLAG
0254 3EFF
                 376
                                     A, OFFH
0256 J2A64F
                 377
                             STA
                                     ACKFLG
0259 C39802:
                 378
                             JMP
                                     RSTAT
                 379
025C C5
                 380 RACALL: PUSH
                                                    ; PUT RECEIVE PACKET ID COUNTER ON STACK
025B CB1F01
                             CALL
                                                    GET DATA BYTE
                 381
                                     DATAIN
                                                    PULL PACKET ID COUNT OFF OF STACK
0260 C1
                 382
                             POF
                             JMP
                                                    CONTINUE CHECKING STATUS OF 8273
0261 033702
                 383
                                     RL2
                 384
0264 JAA64F
                 385 DATCRC: LDA
                                     ACKFL6
                                                  SIGET ACKFLG TO SEE IF DATA HAS BEEN RECEIVED.
0267 FEAA
                             CPI--
                 386
                                     HAAO
                                                    ; IF ACKFLG=OAAH, DATA HAS BEEN RECEIVED
0269 CA4E02
                 387
                             JZ
                                     BADR
                                                    ; IF SO, THEN PACKET IS IN ERROR
026C 3E00
                 288
                             IVM
                                     A, OOH
                                                    ; ELSE, FLASE CRC ERROR WAS DETECTED
```

T.

```
026E 30
                  389
                              Sin
026F 01B96A
                  390
                              LXI
                                       B.OAB9H
                                                       RESET TIME-OUT COUNTER
0272 C9
                  391
                               RET
                                                       CONTINUE LOOKING FOR ACK.
                                                       GET ACK. BYTE
0273 3AB04F
                  392 GOODTX: LDA
                                       ACKBYT
                  393
                                       0A5H
                                                       WAS IT A POSITIVE ACKNOWLEDGEMNET
0276 FEAS
                               CPI
                                       BADR
0278 C24E01
                  374
                               JNZ
                                                       ; IF NOT, SET-UP FOR RETRANSMISSION
                  395
027B 2A834F
                              LHLD
                                       CURRENT
                                                       :GET CURRENT OUTPUT POINTER
                              CALL
                                                       INSURE POINTER IS WITHIN RANGE
027E CDF901
                  .396
                                       OVERFL
                               SHLD
0281 22834F
                  397
                                       CURRENT
0284 22A04F
                  378
                              SHLD
                                       POINTO
                                                       STORE UPDATED POINTERS
                                                       ; GET CURRENT PACKET ID NUMBER
6287 3AAC4F
                  399
                              LDA
                                       ID
028A 3C
                  400
                               INR
                                                       ; INCREMENT ID NUMBER FOR NEXT TRANSMISSION
                                       A
0268 32AC4F
                  401
                              STA
                                       10
                                                       ISTORE NEW ID NUMBER
02BE 3AAD4F
                  402
                              LDA
                                       PACKET
                                                       GET CURRENT PACKET COUNT
                  403
                               DCR
                                                       DECREMENT THAT VALUE
0291 30
0292 32AD4F
                  404
                               STA
                                       PACKET
                                                       STORE NEW VALUE
                               JZ
                                                       (IF PACKET COUNT=0, BUFFER IS EMPT)
0295 CAC402
                  405
                                       EMPTY
                  406
0293 214863
                  407 RSTAT: LXI
                                       H.DR
                                                       ATURN-OFF RECEIVER
029B CD3903
                  408
                               CALL
                                       CHDOUT
029E 3E09
                  409
                               178
                                       A, 09H
                                                       SET INTERRUPT MASK FOR TRANSMISSION
02A0 30
                  410
                               SIM
                  411 -
                                                       :LOAD HE WITH RECEIVER TURN-ON COMMAND LINE
02A1 217400
                              LXI
                                       H. TXSTRT
                                                       REPLACE THAT ADDRESS WITH STACK
02A4 E3
                  412
                               ATHL
02A5 3A0060
                  413 RSTATL: LDA
                                       SSTAT
                                                       ; READ STATUS
02AB E602
                                                       ; ANY RXIE AVAILABLE
                  414
                               ANI
                                       92H
02AA C3
                  415
                              RΖ
                                                       ; IF NO RESLUTS, RETURN
02AB 3A03&0
                  416
                              LDA
                                       RXIR
                                                       ; ELSE, READ INTERRUPT RESULT
02AE CJA502
                  417
                               JHP
                                       RSTATL
                                                       ; CHECK TO SEE IF ANY MORE RESULTS EXIST
                  418
0281 2ABJ4F
                  419 INBYTE: LHLD
                                       CURRENT
                                                       GET CURRENT INPUT FOINTER
                                       SDATAI
                                                       GET INPUT DATA BYTE
0254 3A00B0
                  420
                              LDA
                                       ACKB/T
0287 32804F
                  421
                              STA
                                                       STORE ACKNOWLEDGEMENT BYTE
0284 018904
                  422
                              LXI
                                       B,0A89H
                                                       RESTORE TIME-OUT COUNTER, 24MS
02BD 3EAA
                  423
                               NVI
                                       A, OAAH
                                                       PUT DAAH IN ACKFLG TO SHOW DATA RECEIVED
02BF 32A64F
                  424
                               STA
                                       ACKFL6
02C2 A7
                  425
                               ANA
                                                       RESET ZERO FLAG IN CPU STATUS WORD
0203 09
                  426
                               RET
                  427
0204 216803
                  428 EMPTY: LXI
                                       H, DR
                                                       ; DISABLE RECEIVER
0207 003903
                  429
                               CALL
                                       CHOOUT
02CA 3E0B
                  430
                                                       ISET INTERRUPT MASA, ENABLE 7.5
                                       A.OBH
02CC 36
                  431
                               MIZ
00CD 218A00
                  432
                              LXI
                                       H, INLOOP
                                                       SINCE RAM IS EMPTY, BET A COMPLETE PACKET
0200 E3
                  433
                               XTHL
0281 CJA502
                               JMP
                  434
                                       RSTATL
                  435
                  436
                  438; THE ROUTINES BELOW INITIALIZE THE SERIAL CHIFS
                  435 (661) (661) (661) (661) (661) (661) (661) (661) (661) (661) (661) (661) (661) (661) (661) (661) (661) (661)
                  440
                  441
02D4 3E80.
                  442 I82501: MVI
                                       A,80H
                                                       ;SET-UP TO LOAD BAUD DIVISOR
02D& 320396
                                                       WRITE TO LCR, SET DLAB-1
                  443
                              STA
                                       LCR
0209 3E68
                                                       ;LSB OF DIVISOR, BMHZ CRYSTAL
                  444
                                       A,68H
```

(T

33

		35			.,,,,,,	,,,,,			36			
0355		502 503	MOV A	1, M								
	320150	504		PRNRG		•	,					
0359	C34803	505 506 :	JMP (CMD2		,					,	
4760	Δ4	507 ;		ır.	A1 0111 A		.					
035C		508 OPHODES	: u	B	01,91H,0	100001111	,					
035D												
035E 035F		509 SMODES:	n	Ð	01,0AGH,	0000000	. 5					
0340		307 3000531	S		or, onon,	0000000	· D	•	je.			
												•
0361 0362		510 DTAXS:	ſ	£	01,978,0	11660600	·					
0363		TIO DIMYS.		ı.	011111111	00000011	•					
0364												
0355 0365		511 BITS:	5	Б	01,0A4H,	ນີ້ນີ້ເ ປິ ດໄດ້ຮັກຮັດໄ	15	i				
0366		311 5113.	•		V1, VII 111,	******						
0357												•
0368		512 DR:	Г	16	00,0C5H							
0369		012 5	•									
036A		513 RCV:	ľ)B	02.000Н,	01H.00H						
036B		did korr	•		· · · · · · · · · · · · · · · · · · ·	•••••						
9395												
0360												
		514 ;										
		515 ;								-'		
	•	516 ;										
036E	3E04	517 IXMIT:	HVI A	1,04H		FOUR PA	RAMETER	S IN COMM	IAND .			
0370	32A74F	518	STA)	CMIT		STORE	IN RAM		1			
0373	3EC8	519	MVI A	1,0C8H		GENERAL	. TRANSM	IT COMMAN	D			
0375	32A84F	520	STA	HIT+E								
0378	3E13	521	HVI A	1,13H		;LSB OF	PACKET	LENGTH		,		
037A	32A94F	522		(HIT+2					`.			
	3E00	52 3,		1,00Н		;MSB OF	PACKET	LENGTH				
	32AA4F	524		(MIT+3			<u> </u>			,		
	JEFF	525		, OFFH		; ADDRES	BYTE	O BE SENT		,		
	32AB4F	526		KHIT+4						-	·	
0387	LY	5 27	RET					,				
		528 ;	FNR			·						
	BV455) 8	529	END									
	SYMBOLS Ta4FBO <i>1</i>	ACKFLG A 4FA6	ACKLOP A	ARAA	ACKLP2 A	2006 A	ADATA	A 9000	AGAIN A	5 00ES	ASTAT	4 9005
BAD		BADR A 024E	BAUDLS A		BAUDNS A		BEGIN			A 0365	BUFFER	
CMD1		CMD2 A 0348		034D	CHDOUT A		CNTRL			A OLAS	CONTR	
COUNT	S A FFOC	CRTBUF A 4FBI	CURREN A	4FB3	DATAIN	A 011F	DATCRC			A 013E	DISINR	
		DR A 0368	DTAXS A		EMPTY A	0204	GETACK	A 0205 .	600DR (A 022F	600DTX	A 0273,
		HLOOK2 A OOE2	182501 A		182502		18273			A 4FAC	INBYTE	
		INDONE A 015A	INLOOP A			0107	INPUTD		IXMIT .			A 9003
MAIN		MLOOP A 007E POINTI A 4FA2	NOACK A		OPMODE A	A 0350 A 4FB5	TYBTUG		OUTDAT :		OVERFL	-
		RETFLG A 0177	RETRES A			4 4rb3 A 0231		A 4000 A 0237	RCV I	A 036A A 0298	RESET RSTATL	
		RXIR A 6003		01BC	SCHORE, A		SDATAI		SDATAO I		SMODES	
		SSTAT A 6000	STATLP A		STATUS			A 4FB7	TURNON	-		A 6002
TXON		TXSTAT A 4FAS	TXSTRT A			0179		A 4FA7				

ASSEMBLY COMPLETE. NO ERRORS

MODULE PAGE

LINE SOURCE STATEMENT LOC OBJ COPYRIGHT 1985 ZENITH ELECTRONICS CORP. 3 ; THIS PROGRAM WAS WRITTEN GORDON E. REICHARD ON JUNE 12, 1985 4; THIS IS ONLY A PRELIMINARY VERSION OF THE PROGRAM. 5 ; THE PROGRAM IS CALLED Z-TLM300. THE NAME TLM300 IS THE 6 ; DIRECTORY HAME. 77: THIS PROGRAM IS USED TO RECEIVE DATA FROM THE Z-TCU100 8; LOCATION AT THE CENTRAL OFFICE. THE DATA FROM THAT POINT 9.; IS CONVERTED, BUFFERED, AND LASTLY TRANSFERRED TO THE MUX 10 ; BOARD. 12 ⁵ 13 15; WHEN THE VARIABLE "AREA" IS SET TO FOH, THE PROGRAM "TABLE". 16 : HUST BE USED TO PROGRAM THE 2732 EPRON (IC 7) WITH THE 17 : CORRECT AREA CODE CONVERSIONS. 19 20 22; BELOW ARE THE EQUATE STATEMENTS ASSIGNING LABELS TO ADDRESS ;ASYNC DATA PORT, 8250 9000H 27 ADATA EQU 9000 **ADATA** LSB OF BAUD RATE 28 BAUDLS EQU 9000 ; MSB OF BAUD RATE 29 BAUDMS EQU ADATA+1 9001 ;LINE CONTROL REG. 8250 30 LCR ADATA+3 9003 ADATA+1 DISABLE INTERRUPT REG. 8250 31 DISINR EQU 9601 ;ASYNC STATUS PORT, 8250 ADATA+5 32 ASTAT EQU 9005 33 RAH EBN 4000H 4000 ; IN AND OUT BUFFER RAM 34 BUFFER EQU 4000 SYNC COMMAND REG. 8273 35 SCHORE EQU H0004 6000 SCHDRG SYNC STATUS REG. 8273 6000 36 SSTAT EQU ;SYNC PARAMETER REG. 37 SPRMRG SCHDR6+1 6001 EQU RESULT REGISTER SPRMRG 38 RESULT EQU 6001 ; TRANSMIT INTERRUPT REG. SCHOR6+2 39 TXIR EDU 6002 ; RECEIVER INTERRUPT REG. SCMDRG+3 6003 40 RXIR EQU ;OUTPUT POINTER 41-POINTO 4FA0H 4FAÚ ; INPUT POINTER 42 POINTI EQU POINTO+2 4FA2 SYNC DATA OUTPUT, 8273 43 SDATAO EQU 7000H 7000 ;SYNC DATA INPUT, 8273 0B000H 44 SDATAI EQU B006 45 INCOME EQU POINTI+2 ; INCOMING DATA PACKET PENDING 4F44 CURRENT 8273 X-MIT STATUS 46-TXSTAT ERU POINTI+3 4FHS

POINTI+4

POINTI+5

XHIT+5

47 ACKFLG EQU

48 XMIT

49 CHTRL

EQU

EQU

; ACKNOWLEDGEMENT FLAG

START ADDRESS OF X-MIT SET-UP

CONTROL FIELD FOR SOLC FRAME

The face has been been to be the first time for the first fi

4FA6

4FA7

4FAC

T. L

N

1312 7F

102

103

1815 1815 BF

DB 011111118 -101 -ORS 1815H

104 98 101111111 105

;312 AREA CODE

:815 AREA CODE

```
1414
                108
                          086
                                 1414H
1414 FF
                107
                          DB
                                 1111111111
                                               ;414 AREA CODE
                103
                          ;
                109
               111; THIS IS THE LOOK-UP TABLE CONTAINING THE HULTIPLIERS USED
               112; BYTE THE MULTI SUB-ROUTINE.
               114
               115
ÚÁÚÚ
               116
                                              ;LOOK-UP TABLE FOR ASCII CHVERSION
                          ORG
                                 HOOAO
0A00 0600
                                 0000H
               117 LT1000: DW
                                              ;0000
0A02 E803
                                 03E8H
               118
                          DW
                                              ;1000
0A04 D007
               119
                          Đ₩
                                '07D0H
                                              ;2000
0A06 B808
               120
                          DN
                                 OBB8H
                                              ;3000
OAOB AOOF
               121
                          DH
                                 OFAOH
                                              ;4000
0A0A 8813
               122
                          D₩
                                 1388H
                                              ;5000
0A0C 7017
               123
                          ₽₩
                                 1770H
                                              16000
                          DW
                                 1858H
                                              :7000
0A0E 581B
               124
0A10 401F
               125
                          DW
                                 1F4Vii
                                              :8000
0A12 2823
               126
                          ĐΝ
                                2328H
                                             . ;9000
               127
0800
               128
                         ORG
                                OBCOH
                                              ;000
0800 0000 -
               129 LT100:
                         DW
                                 0000H
                          Ď¥
                                0064H
0802 6400
               130
                                              ;100
6804 CB00
               131
                          DW
                                 00C8H
                                              ;200
0B06 2C01
                         OW
                                012CH
               132
                                              ;300
0808 9001
                          DW
                                0190H
                                              ;400
               133
080A F401
               134
                         D₩
                                01F4H
                                              :500
0800 5802
                          ₽W
                                0258H
                                              ;600
               135
080E BG01
               136
                         D¥
                                02BCH
                                              ;700
                         DK
                                0320H
                                              ;800
0810 2003
               137
OB12 8403
               138
                         D₩
                                0384H
                                              ;900
               139
                                0000H
0000
               140
                         OR6
                                OOH
                                              :00
OC00 00
               141 LT10:
                         DB
OCOL OA
               142
                         08
                                OAH
                                              ;10
                         DB
                                14H
                                              120
00001 14
               143
0C03 1E
               144
                         DB
                                1EH
                                              ;30
0004 28
               145
                         DB
                                28H
                                              ;40
0C05 32
               144
                         DB
                                32H
                                              ;50
0006 30
               147
                         DB
                                3CH
                                              $60
0C07 46
                         08
                                46H
                                              ;70
               148
0008 50
               149
                         00
                                50H
                                              ;80
0C09 5A
               150
                         DB
                                              ;90
               151
               152
               153
               154
               156; THIS IS THE BEGINNING OF THE PROGRAM. THIS PORTION OF THE
               157; PROGRAM TO THE START OF THE MAIN BODY OF THE PROGRAM PERFORMS
               158; REGITER AND CHIP INITIALIZATION.
               160
               161
                         ;
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				4	,755,872
		43		,	44
0000		162	GRG	0000H	,
((()))	ΕÏ	163	D I		
0001		164	KVI	A, IEH	(ENFEL:
0003		165	SIM		SET INTERRUPT MASK
	210040	166	LXI	H,RAM '	SET ALL POINTERS TO TOP OF RAM
	22834F	167	SHLD	CURRENT	yaay naa i gantana ya i ar i ii
	22A24F	168	SHLD	POINTI-	
	22A04F	169	SHLD	POINTO	
	22904F	170	SHLD	HPCNVT	
	22924F	171	SHLD	HPSAVE	
	21BA4F	172	LXI	H, ADDRES	
	22BD4F	173	SHLD	TXPNT	SET ACK. TRANSMIT OUTPUT POINTER
	212640	174	LXI	H, TOPOUT	JULI NEK. IRANSIII ODII OI TOZAVEN
	228A4F	175	SHLD	CNVRTP	;SET-UP OUTPUT BUFFER POINTER
			JMP		1961-OF OUTER BOTTER POTATER
0047	C34000	176		BEGIN	
4405		177	; ann	AAGCU	. DCT E F
0025	674764	178	0R6	002CH	;RST 5.5
002L	C30701	179	JMP	INPOAT	•
		180	;	247411	
0034	07F0A1	181	ORG	0034H	1RST 6.5
0024	C3ED01	182	JMP	OUTACK	•
		183	;		
0030		184	ORS	003CH	;RST 7.5
0030	C38102	185	JMP	OUTERT	
	•	186	i		
0040		187	ORG	0040н	; BEGINNING OF MAIN PROGRAM
	OLFFFF	188 BEGIN:	LU	B,OFFFFH	
	3200E0	189 TL1:	STA	RESET	THIT RESET CIRCUIT
0046	,	190	DCX	В	,
0047		.191	HOV	A,B	
0048		192	ANA -	A	
	C24360	193	JNZ	TLI	
0040		194	MOV	A, E	
004D		195	ANA	A	÷.
	C24300	196	JNZ	TLI	
	310050	197, START:	LXI	SP,5000H	SET STACK POINTER TO TOP
	CD9902	198	CALL	182501	
	CDDC02	199 *	CALL	182502	•
	CDBD02	200	CALL	18273	
	CD3303	201	CALL	IXHIT	;SET-UP OUTFUT ARRAY
	CD4803	202	CALL	18255	0
0082		203	HVI	А,00Н	
	32BB4F	204	STA	ID	STORE PACKET ID
	J2AD4F	205	STA	PACKET	; ZERO PACKET COUNT
	32B74F	206	STA	GETID	RESET DATA COUNTER TO GET ID
	329E4F	207	STA	CNVBUF	RESET CONVERT BUFFER EMPTY FLAG
	32BC4F	208	STA	TXFLG	INO DATA READY FOR TRANSFER TO HP
(v)74		209	HVI	A,OFH	SET REPEAT PACKET COUNT TO-15
	328E4F	210	STA	Sanpac	
0079		211	IVI	A,OFFH	; ADDRESS TO BE SENT IN ALL ACK. FACKETS
0978	J2BA4F	212	STÁ	ADDRES	
	<i>'</i>	213	i		
		214 (1)(1)(1)	13113311	1111111111111	

^{215;} THIS MARKS THE START OF THE MAIN BODY OF THE PROGRAM. FROM THIS 216; MAIN BODY, ALL OTHER ROUTINES ARE CALLED. THIS PORTION OF THE 217; PROGRAM CONTROLS THE FLOW OF PROGRAM OPERATION.

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		218	;;;;;;	;;;;;;	;;;;;;;;;	4,5,5,6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,6,
		219		;		
		220		;		
	3ABC4F		RECON:	LDA	TXFLE	; SEE IF THERE IS DATA READY FOR TRANSFER
1800		222		ANA	A	SEE IF THERE ARE ANY PACKETS READY FOR XMIT
	CAA700	223		JZ	MLOOP	; IF NOT, WAIT TO RECEIVE
0085		224	,	RIM		;ELSE, SEE IF BOARD IS SELECTED
9860		225		RLC		
	DC3E02	226		CC	HPOUT	; IF SO, OUTPUT CONVERTED DATA PACKET (CC)
0084	212F03	227 228		LXI	H, RCV	;ELSE, PREPARE TO RECEIVE WHILE WAITING ;TO TRANSFER TO MUX BOARD
0080	CDFE02	229		CALL	CHDOUT	
0090	FB	230	MLOOP3:	EI		•
0091	3 200 E0	231		STA	RESET	•
0094	00	232		NOP		
0095	00	233		NOP		
0076	F3	234		DI		,
0097	JA8C4F	235		LDA	TXFLG	; HAS TRANSFER OCCURRED
009A	A7	236		ANA	A	,
009B	Caadoo	237		JZ	MLOOP2	; IF SO, RETURN TO ORIGINAL LOOP
009E	20	238		RIM		GET CURRENT INTERRUPT STATUS
009F	07	239		RLC	-	; SEE IF BOARD IS BEING SELECTING
	DC3E02	240		CC	HPOUT	IF SO, BEGIN TRANSFER TO MUX BOARD
00A3		241		EI		ELSE ENABLE INTERRUPTS AND CONTINUE WAITING
00A4	C39000	242		JMP ;	MLOOP3	8
00A7	212F03		MLOOP:	ĹXI	H, RCV	PREPARE TO TURN-ON RECEIVER
	CDFE02	- 245		CALL	CMDOUT	OUTPUT COMMANDS
OUAD			MLOOF2:			ENABLE INTERRUFTS AND WAIT FOR DATA
	3200E0	247		STA	RESET	HIT THE RESET CIRCUIT
	3A0060	248		LDA	SSTAT	GET CURRENT STATUS FROM 8372
0084	00	249		NOP		
00B5		250		NOP		•
0086	C3ADOO	251		JMP	MLOOP2	•
		252		;		
		253		;		
00B9	3A9E4F	254	TXSTRT:	LDA	CNVBUF	SET CONVERT BUFFER FLAG
OOBC	Á7	255		ANA	A	; IS THE CONVERTER BUFFER FULL
OOBD	C2E800	256		JNZ	TX1	; IF NOT, CONTINUE
0000	3A8D4F	257		LDA	DATAVA	; SEE IF VALID DATA IS AVAILABLE FOR CONVERSION
00C3	A7	258		ANA	Α,	
00C4	CAE800	259		JZ	TXI	; IF NOT DATA AVAILABLE, BEGIN RETRANSMISSION
00C7	2A904F	260		LHLD	HPCNVT	ELSE PREPARE TO CONVERT DATA PACKET
OOCA	3E10	261		NVI	A, 10H	•
	CD5D03	- 262		CALL	OFFSET	•
	22924F	263		SHLD	KPSAVE	· ·
	CD6403	264		CALL	CNVRT3	CONVERT DATA PACKET
0005	2A904F	265		LHLD	HPĊNVT	
8000	3E13	. 266		MVI	A, 13H	<i>:</i>
OODA	CD5D03	267		CALL	OFFSET	SUPPATE DATA CONVERTER POINTER TO POINT
•		248				; AT NEXT DATA PACKET TO BE CONVERTED
0000		269		MVI	A, 26H	,
OODF		270		CMP	L	IS REG. L READY TO BE RESET TO LOCATION I
	C2E500	271		JNZ	TXCONT	SIF NOT CONTINUE
00E3		272		IVK	L,00H	; ELSE RESET TO LOCATION 1
	22904F		TXCONT:		HPCNVT	STORE NEW VALUE OF CONVERTER POINTER
00EB	21A74F	274	TX1:	LXI	H, XHIT	PREPARE TO TURN-ON TRANSMITTER
						and the second s

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the feet of the control of the feet of the

	0138 E3	332	XTHL.		; SWITCH WITH STACK
	013C C34B01	333	JHP	RSTAT	GOTO STATUS LOOP
	013F 3EA5	334 GOBDR:	IVH	A,OA5H	:POSITIVE ACKNOWLEDGEMENT
	0141 32BC4F	335	STA	TXBYTE	·
	0144 328D4F	336	STA	DATAVA.	SET DATA AVAILABLE FLAG
	0147 218900	33 7.	LXI	H, TXSTRT	SET RETURN VECTOR TO CONVERT DATA AND TRANS.
	014A E3	338	XTHL	`.	SWITCH WITH STACK
	014B 00	339 RSTAT:			· .
	0140 00	340	NOP		•
	014D 00	341	NOP		•
	014E 00	342	NOP		•
	014F 00	343	NOF		
	0150 00	344	NOP		
	0151 3E08	345	HVI	A,08H	;ENABLE ALL INTERRUPTS
	1			H, VON	SEURDLE MEET INTERNOTIO
	0153 30	346	SIN	4 1811	THE CARRESON PETHON THE COT CHEFT
	0154 3EOD	347	KVI	A.00H .	; PUT CARRIAGE RETURN INTO CRT BUFFER
	0156 32864F	348	STA	CRTBUF	; PUT CARRIAGE RETURN IN CRT BUFFER
	0159 3A0060	349 RSTATL	: LDA	SSTAT	READ STATUS
	015C E608	350	ANI	08H	ANY RECEIVER INTERRUPTS PENDING
	015E C8	351	RZ		; IF NO RETURN
	015F 3A0060	352	LDA	SSTAT	; ELSE, READ STATUS AGAIN TO CHECK FOR RXIS
	0162 E602	353	ANI	02H	IS A RXIR AVAILABLE
	0164 CA5901	354	JZ	RSTATL	; IF NOT, MAIT
,		355	LDA	RXIR	;ELSE, READ INTERRUPT RESULT BYTE
	0167 3A0360				CHECK TO SEE IF ANY MORE RESULTS EXIST
	016A C35901	356 357	JMP	RSTATL	THECK IN SEC. IL MAI DONE MESOCIO EXIST
4		-357	;		TO THE ANNU BATA HAD BETH THRUT VET
	016D 3AB74F	358 DATERE		GETID	SEE IF ANY DATA HAS BEEN INPUT YET
	0170 A7	359	ANA	A	; SEE IF IERO
	0171 C27801	360	JNZ	BADCRC	ı
	0174 JE0A	361	HVI	A,OAH	; ENABLE 7.5 AND 5.5
-	0176 30	362	SIM		
	0177 C9	36 3	RET		
	0178 3E00	364 BADCRC		A,00H	,
pro-	017A 32B74F	365	STA	GETID .	CLEAR HEADER COUNTER
	017D C33301	386	JMP	BADR	,
	V1/1 000001	367	;	21,211	
	0190 3E0E	368 INBYTE		A, OEH	SET INTERRUPT MASK TO INPUT SERIAL DATA
				H, VEN	JOET THICKNOT I HADE TO THE OF DELIGE DATE
	0182 30	369 •	SIM	CETIN	ACET DATA-INDUT COMMEC
	0183 3AB74F	370	LDA	GETID	GET DATA INPUT COUNTER
	0189 EP03	371	ANI	02H	SEE IF DATA, ID, OR ADDRESS IS EXPECTED
	0188 C29401	372	JNZ	REALDT	; IF 2 OR 3, INPUT BYTE IS DATA OR ID
	0188 3E02	373	IVK	A,02H	÷
	018D 32B74F	- 374	STA	6ETID	STORE 2, ADDRESS ALREADY RECEIVED
	0190 3A00B0	375	LDA	SDATAI	FREAD ADDRESS TO CLEAR INTERRUPTS
	0193 C9	376	RET		
	0194 FE02	377 REALDT		02H	IS BYTE DATA OR ID
	0196 C2DE01	378	JNZ	GETBYT	IF VALUE IS 2, INPUT BYTE IS ID
	0199 3E03	379	MVI	A,03H	,
	0198 32874F	380	STA	GETID *	STORE 3, ID AND ADDRESS ALREADY RECEIVED
					· · · · · · · · · · · · · · · · · · ·
	019E 3A00B0	381	LDA	SDATAI	;READ INPUT BYTE, ID
	01A1 47	382	MOV	B, A	; PUT ID INTO REG. B
	01A2 3ABB4F	383	LDA	ID	GET PREVIOUS PACKET ID
	BB ZAIO	3B4	CNP	B . #	
	01A6 C2BB01	385	JNI	NEWPAC	, , , , , , , , , , , , , , , , , , , ,
	01A9 218E4F	386 SAMEPC:	LXI	H, SAMPAC	PUT LOCATION OF REPEAT PACKET COUNT INTO HE
	01AC 35	387	DCB.	H	; DECREMENT CURRENT REPEAT PACKET: COUNT
	OIAD CABTOL	388	JI	RSLOP	; IF 15 REPEAT HAVE BEEN RECEIVED, RESET BOARD
				1	

	51	•,,	52
01B0 2AA24F 3	BS LHLD	POINTI	;ELSE, PACKET IS RETRANS. RESET POINTERS
	O SHLD	CURRENT	YELGE THERET IS RETRIBUTION TO THE COLUMN
	91 RET	CURRENT	
			THIS IS A INFINITE LOOP TO RESET BOARD
	72 RSLOP: NOP	5.0.05	STHIS IS A IMPINITE LOOP TO RESET BORKD
	95 JHP	RSLOP	
	74 NEWPAC: MQV	А, 9	; PUT NEWLY READ ID BACK INTO A
01BC 32BB4F 39	75 STA	10	STORE NEW PACKET ID
01BF 2AB34F ' 39	i6 LHLD	CURRENT	SINCE NEW DATA, UPDATE POINTERS
0102 70 39	77 KDV	A,L	PUT REG. L INTO A
01C3 FE26 39	B. CPI	26H	HAS INPUT LOCATION 2 BEEN LOADED
0105 C2CA01 .39	79. JNZ	NEWCON	; IF NOT, PUT DATA THERE
01C8 2E00 40	ivm oo	L,00H	; ELSE, PUT DATA IN LOCATION I
_	OI NEWCON: SHLD	CURRENT .	
	2 SHLD	POINTI	
OLDO BAADAF -4		PACKET	GET CURRENT PACKET COUNT
)4 CPI	одон .	IS PACKET COUNT AT MAXIMUM
)4 C.1 1	V4VII .	; IF SO, RETURN
			ELSE, INCREMENT THE PACKET COUNT
	Dé INR	A	· · · · · · · · · · · · · · · · · · ·
	07 STA	PACKET	STORE UPDATED VALUE
	06 RET		+-
	O9 GETBYT: MVI	a, oah	SET INTERRUPT MASK TO OUTPUT TO CRT
0100 30 4	10 SIM		
01DE 2ABJ4F 4:	II LHLD	CURRENT	GET CURRENT INPUT POINTER
01E1 3A00B0 4	12 LDA	SDATAI	SET INPUT DATA BYTE
	13. HO V	H,A	SAVE BYTE IN RAN
01E5 32864F 4	14 STA	CRTBUF	; PUT DATA BYTE IN CRT OUTPUT BUFFER
01E8 23 4.	15 INX	Н	•
01E9 22B34F .4	16' SHLD	CURRENT	STORE UPDATED POINTER
01EC C9 - 4:	17 RET	-	
. 4	18 i		•
4:	19 ;		
. 4:	20 ;;;;;;;;;;;;;	;;;;;;;;;;;;;;;;	\$\$\$\$\$\$\$\$\$\$\$\$\$
			LE DATA BYTE TO THE 8273 UPON
			CHECKS FOR TRANSMISSION ERRORS AND
	23 ; END-OF-MESS		
			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
	25 ;	*********	• 1,
	?6 . ;		
	27 ;	4	
	26 OUTACK: LDA	SSTAT	GET STATUS FROM 8273
1	29 STA	STATUS	STORE CURRENT STATUS
01F3 E601 - 4		01H	:15 THERE AN INTERRUPT RESULT AVAIL.
	30 ANI 31 JZ	OUTBYT	; IF NOT, OUTPUT DATA BYTE
		STATUS	•
	32 LDA		GET PREVIOUSLY READ STATUS BYTE GET THERE AN IMMEDIATE RESULT AVAIL.
	33 ANI	10H	· ·
	34 JZ	CONT	:IF NOT CONTINUE ON
	35 LDA	6001H	; IF SD, READ RESULT
	Sé RET	74.75	ARTAR INTERRUST BERMET BUTT
4	37 CONT: LOA	TXIR	READ INTERRUFT RESULT BYTE
0207 FE05 4		, ODH	IS PACKET COMPLETE AND ERROP FREE
0209 C21602 43	sə ini	BAD	; IF NOT, GOTO TO BAD
LGC OBJ LI	NE SOURCE	STATEMENT	•
020C 21BA4F 4	40 LXI	H, ADDRES	ELSE, RESET ACK. BUFFER POINTER
	II SHLD	TXPNT	iccor, neses non- butter ruinien .
	12 JNE.	STATLP	CHECK AGAIN
T	·- Billy	ALLEY E	JUNEON HUMIN

```
53
                   443
 0215 00
                               NOP
                                                      ; TURN RECEIVER ON AT THIS POINT ..
 0216 21BA4F
                   444 BAD:
                               LXI
                                       H. ADDRES
 0219 22BD4F
                               SHLD
                                      TXPNT
                   445
                   446
 021E 3A0060
                   447 STATLP: LDA
                                       SSTAT
                                                      GET STATUS BYTE TO CHECK, FOR RESULTS
 021F E601
                   448
                               ANI
                                       HIO
                                                      FARE THERE ANY MORE RESULTS AVAILABLE
 0221 CA2A02
                   449
                               IJ
                                       TURNON
                                                      ; IF NO RESULTS, RETURN - (RZ)
 0224 3A0260
                   450
                               LDA
                                       TXIR
                                                      FREAD INTERRUPT RESULT BYTE
 0227 C31C02
                  451
                               JMP
                                      STATLP
                                                      ; CHECK FOR MORE RESULT BYTES
 022A 217E00
                   452 TURNON: LXI
                                       H, RECON
                                                      ;LOAD HL WITH RETURN ADDRESS
 022D E3.
                  453
                              KTHL
                                                      ; PUT ON TOP OF STACK
 022E 3E0E
                   454
                               KVI
                                                      ; SET INTR. MASK TO RECEIVE
                                       A. OEH
 0230 30
                  455
                              SIM
 0231 C9
                  456
                               RET
 0232 2ABD4F
                  457 OUTBYT: LHLO
                                      TXPNT
                                                    - GET CURRENT ACK: OUTPUT DATA POINTER
 0235 7E
                  458
                              HOV
                                      A,N
                                                      PUT DATA BYTE, INTO A
 0236 320670
                  459
                                      SDATAO
                                                     -; OUTPUT DATA TO 8273
                              STA
 0239 23
                   460
                              INX
                                      н
 023A 22BD4F
                  461
                              SHLD
                                      TXPNT
                                                      STORE UPDATED ACK. OUPUT POINTER
 023B C9
                  462
                              RET
                  463
                  464
                  465 {{{\information }
                  466; THIS ROUTINE OUTPUT 8-BIT PARALLEL DATA TO THE MUX BOARD VIA
                  467; THE 8255 T/O CHIP. IC4 PORT B IS USED FOR THIS PURPOSE.
                  469
                  470
                  471 HPOUT: NVI
023E 3E2F
                                      A. MSTOP
                                                      PREPARE TO STOP MUX BOARD FROM POLLING
 0240 D320
                              OUT
                                      PORT5A
                                                      ; PULL NUX STOP LINE HIGH
                  472
0242 20
                  473
                              RIM
                                                      ; SEE IF THIS BOARD IS STILL SELECTED
0243 07
                  474
                              RLC
0244 DA4C02
                  475
                              JC
                                      HPLOP1
                                                      ; IF STILL SELECTED, BEGIN OUTPUTTING (JC)
0247 3EFF
                              MVI
                                      A, MUXRUN
                                                     ¡ELSE, RELEASE MUX BOARD AND RETURN
                  476
0249 0320
                  477
                              OUT
                                      PORTSA'
                                                      RESET STOP LINE LOW
024B C9
                  478
                              RET
                  479
                                      A,00001100B
024C 3E0C
                  480 HPLOP1: MVI
                                                      PREPARE TO ENABLE OUTPUTS ON 74LS245
024E- 0313
                              OUT
                                      CPORT4
                  481
                                                      FRESET BIT 6, PORT 4C
0250, 212640
                  482
                             LXI
                                      H, TOPOUT
                                                      PUT DUTPUT DATA POINTER INTO H AND L
0253 7E
                  483 HPLOP2: NOV
                                      A, M
                                                      GET DATA BYTE
0254 D311
                  484
                             DUT
                                      PORT4B
                                                      COUTPUT TO MUX BOARD
0256 00
                  485
                              NOF
                                                      ;ALLON OUTPUT DATA TO STABLIZE
0257 00
                  486
                             NOP
0258 3200D0
                  487
                             STA
                                     HUXWR
                                                      STROBE DATA INTO MUX BOARD
                  488
                              IN
0258 23
                                     Н
                                                      ; INCREMENT OUTPUT POINTER AND CONTINUE
025C JA8A4F
                  489
                             LDA
                                     CNVRTP
                                                     ; GET ADDRESS OF LAST CONVERTED PACKET
025F BD
                  490
                             CHP
                                                     ; HAS ALL CONVERTED DATA BEEN TRANSFERRED
                                     L
0260 C25302
                                     HPLOP2
                 491
                             JNZ
                                                     ; IF NOT, CONTINUE TRANSFER PROCESS
0263 3ABB4F
                  492
                             LDA
                                     CNVRTH
                                                     ; GET MSB OF ADDRESS
                             CMP
0266 BC
                 493
                                                     -; DO THEY MATCH
0267 C25302
                 494
                             JNZ
                                                     ; IF NOT, CONTINUE TRANSFER
                                     HPLOP2
                  495
026A JEOD
                  496 OUTDON: HVI
                                     A,00001101B
                                                     IDISABLE OUTPUT ON 74LS245
026C D313
                  497
                             DUT.
                                     CPORT4
                                                     ;SET BIT &, PORT 4C
026E 3EFF
                  498
                                     A. MUXRUN
                                                     PREPARE TO RELEASE MUX BOARD
```

```
55
                                                                      56
0270 D320
                499
                          OUT
                                 PORT5A
                                               STOP LINE LOW
                          HVI
0272 3E00
               500
                                 A, OOH
                                               FRESET BUFFER FULL FLAG
                          STA
                                 CNVBUF
0274 329E4F
                501
                                               RESET TXFLG, NO DATA READY FOR TRANSFER
               502
                          STA
                                 TXFLG
0277 328C4F
                                               RESET CONVERTER POINTER TO TOP-OF-BUFFER
027A 212640
                503
                          LXI
                                 H. TOPOUT
027D 228A4F
                          SHLD
                                 CNVRTP
               504
                          RET
0280 C9
                505
                506
                507
                509; THIS IS THE ROUTINE TO OUTPUT THE INPUT DATA TO THE CRT CONSOLE.
               510; DATA TO BE OUTPUT IS PLACED IN THE CRIBUF PRIOR TO THE CALLING
                511; OF THIS ROUTINE.
                513
               514
               515 DUTCRT: LDA
                                 CRTBUF
                                               :SET DATA BYTE TO BE OUTPUT
0281 3AB64F
                                               ; OUTPUT DATA TO CRT VIA J5 OR J3, (ICI)
                          STA
                                 ADATA
0284 320090
               516
                          CPI
                                 ODH
                                               ; WAS OUTPUT BYTE A CR
0287 FE0D
               517 -
                518
                          JZ
                                 PUTLF
                                               ; IF SO, PREFARE TO OUTPUT LF
0289 CA9002
028C 3E1C
               519-
                          NVI
                                 A, 1CH
                                               SET INTERRUPT MASK TO WAIT FOR INPUT INTE.
                520
                          SIM
028E 30
                521
                          RET
028F C9
               522 PUTLF:
                          1VH
                                 A, 1CH
                                               ; ENABLE BOTH 6.5 ONLY
0250 3E1C
                523 ...
                          SIM
0292 30
                                               ; PUT LF IN CRT BUFFER
                          IVM
                                 A. OAH
0293 3E0A
               524
                                 CRIBUF
                525
                          STA
0295 32864F
                          RET
0298 C9
                526
                527
                          ;
                529; BELOW ARE THE ROUTINES TO SET-UP AND INITIALIZE THE 8256'S
                530; AND THE 8273.
                532
                533
                534 182501: MVI
                                 A,80H
                                               ;SET-UP TO LOAD BAUD DIVISOR
0299 3EB0
                                                ;WRITE TO LCR, SET DLAB=1
0298 320390
                535 -
                          STA
                                 LCR
                                               ;LSB OF DIVISOR, 8MHZ CRYSTAL (2400)
029E 3E34
                          IVN
                                 A,34H
                536
                                 BAUDLS
                                                ;4FH FOR 6NHZ CRYSTAL
02A0 320090
                537
                          STA
                                               ; MSB OF DIVISOR
02A3 3E00
                          HVI
                538
                                 A,00H
02A5 320190
                539
                                 BAUDHS
                          STA
02AB 3E07
                540
                          IVN
                                 A.07
                                               18-BITS, NO PARITY, 2 STOP BITS
02AA 320390
                541
                          STA
                                 LCR
                                                SET-UP OPERATING CONDITIONS
02AD 3E00
                542
                          HVI
                                 A,00H
02AF 320590
                543
                          STA
                                 ASTAT
                                                CLEAR LINE STATUS REGISTER
02B2 3E02
               544
                          IVH
                                               ; ENABLE IX BUFFER EMPTY INTERRUPT
                                 A,02H
0284 320190
                545
                          5TA
                                 DISINR
                                               ; INTERRUPT ENABLE REGISTER
               546
                          HVI
                                               ; ACTIVATE MODEM CONTROL LINES
02B7 3E0F
                                 A,OFH
0289 320490
                547
                          STA
                                 LCR+1
02BC C9
               548
                          RET
                549 ;
                550 ;
02BD 212103
                551 18273:
                          LXI
                                 H, OPMODES
02C0 CDFE02
                552 .
                          CALL
                                 CHDOUT
02E3 212403
                553
                          LXI
                                 H, SMODES
02C6 CDFE02
                554
                          CALL
                                 CHDOUT
```

N

n

Q

Ţ,

w.

H, DTAXS CMDOUT

H, BITS

57

LXI

CALL

LXI

555

556

557

0209 212703

02CC CDFE02

02CF 212A03

58

	02CF 212A03	557	FXI	H, BITS	į
	02D2 ,CDFE02	558	CALL	CHDOUT	·
	0205 212F03	559	LXI	H,RCV	
	02D8 CDFE02	Sáű	CALL	CHDOUT	
•	02DB-:C9	561	RET	0,12001	
	V200-,07	502 ;	NE I		
		563 (
	448C 7FD4		MILT		
	02DC 3EB0	564 182502:		H08,A	SET-UP TO LOAD BAUD DIVISOR
-	02DE 320380	545	STA	8003H	; WRITE TO LCR, SET DLAB=1
	02E1 3E68	566	HVI	A, 68H	LSB OF DIVISOR, BMHZ CRYSTAL
	02E3 320080	567	STA	HOOOH	;4FH FOR 6MHZ CRYSTAL
	02E6-3E00	568	IVM	A, 00H	; MSB OF DIVISOR
	02E8 320180	569	STA	8001H	,
	02EB 3E07	570	HVI	A,07	;8-BITS, NO PARITY, 2 STOP BITS
	02ED 320380	571	STA	8003H	SET-UP OPERATING CONDITIONS
	02F0 3E00	572	HVI	A,GOH	•
	02F2 320180	573	STA	8001H	CLEAR LINE STATUS REGISTER
	02F5 320580	574	STA	8005H	DISABLE INTERRUPTS
	02F8 3E0F	575	IVM	A, OFH	, and the second
	02FA 320480	576	STA	8004H	
	02FD C9	577	RET	חדטטט	,
= m ²	OTLA C1		NE I		•
÷.3	AGEC AE76	578 ;	MILIT	0.700	
15 15	02FE 0E30	579 CHDOUT:		С,30Н	
	0300 46	580	MOV	B, M	T
tens .	0301 23	581	INX	H	sã n
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0302 3A0060	582 CMD1:	LDA	SSTAT	
1	0305 07	583	RLC	 .	
Ţ.,	0306 DA0203	584	JC	CHDI	
: · :::::::::::::::::::::::::::::::::::	0309 7E	58 5	VOK	A, M	
i f	030A 320060	586	STA	SCNDRG	
	0300 78	587 CMD2:	KOV	A,B	
ud.	030E A7	· 588	ANA	A	· · **
	030F C8	589	RZ		, •
	0310 23	59û	INX	H	
::::::::::::::::::::::::::::::::::::::	0311 05	591	DCR	В	
1	0312 3A0060	592 CMD3:	LDA	SSTAT	· .
	0315 E620	593	ANI	20H	
شم	0317 CZ1203	594	JNZ	CMD3	
	031A 7E	595	MOV	A, H	
	031B 320160	596	STA	SPRMRG	
	031E C30D03	597	JHF	CMD2	
	***************************************	598 ;	••••	01122	,
		599 ;			
	0321 61	600 OPHODES:		DB	01,51H,00000011B ;NON-BUFFERED MODE
	0322 91	•		99	OIT / INT GOOGGOTTE THOUSE THE HOPE
	0323 03	, ,			
•	0324 01	(A) CHOOCS:		or.	A F AACH AACASASA
		601 SMODES:		DB	01,0A0H,000000003
	0025 AG			_	
	0326 00				
	0327 01	602 DTAXS:		DB	01,97H,00000001B
	0328 97				
	0329 01				•
	032A 01	603 BITS:		DB	01,0A4H,00000000Ê
	032B A4				
					•

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					4,755,872	
			59			60
0320		•				
0321		604 E	R:	DB	00,0C5H	,
	E 65					
	02	605 F	icv:	DB	02,0C0H.15H.60H	;RECEIVE 19 BYTES
) C0					
0333						
033	2 00					
		606				; PLUS ADDRESS AND ID
		607				
		608 (4 45 1	. 7115 . 671	AMPTERS IN SAMMANS
•	3502		IVM :TIMX	•		RAMETERS IN COMMAND
	5 32A74F	610	STA		STORE	
	3 3EC3	611	1VM	•		TRANSKIT COMMAND
	32A84F		STA			DACKET LENGTH
) 3E03	613.	IVN			PACKET LENGTH
	5 32A94F 3 3E00 .	614	STA			BACKET LEHETU
	: 3600 . 32444F	615 616	nvi Sta		יוט פכחי	PACKET LENGTH .
0347		617	RET			
0341	L7	617	ne)			
		619	•			

					ZES BOTH 8255 CH	
		623	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,,,,,,,,,	,,,,,,,,,,,,,,,,,	,
		624				
0348	3E96		8255: MYI	A.10010	000B ; CONTROL	WGRD. MODE O. A=INPUT
		. 626		•		C=OUTPUT
0348	D212	627	OUT	CPORT4		
0348	3E82	628	IVM	A,10000	O10B . ; CONTRO	. WORD, MODE O, A=OUPÚT
		629			; B AND	INPUT
	D323	630	OUT			· ·
	3E1F	129	MAI			IUX BGARD
	0320	632	DUT			JTPUT PORT 5A, THIS ALSO RESETS MU)
0354	3EFF	633	WAI	A,OFFH		OUTPUTS AND SET DIRECTION OF
0.75		634	2117		; 1013,	74LS245.
	D312	635	OUT			
	3EFF	636	IVM	,	N JKELEASI	E MUX FROM ACTIVE RESET
	D320	637	OUT	PORT5A		
0350		638	RET			•
		639 640	į			
			; 			4 * * * * * * * * * * * * * * * * * * *
						iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
					IS RETURNED IN H	
		•				1;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
		645	1	,,,,,,,,,,,,	* * * * * * * * * * * * * * * * * * * *	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
		645	;		5 5	
0350	85	a47 0	FFSET: ADD	L	; ADD THE	VALUE IN RES. A TO REG. L
035E	6F	448	VOK	L.A	: REPLACE	RES. L WITH NEW VALUE
	3E00	649	MVI	A,00H	, ALI LIUL	, -
0361	8C	·· 650	ADC_		;ADD CAR	RY (IF'ANY) TO REG. H
0362	67	651	MOV	H,A	•	H WITH NEW VALUE
0293	C9	652	RET	•	, .=. ==	
	•	653	ţ			
		654	j			•

```
61
               456; THIS ROUTINE CONVERTS A 3-DIGIT NUMBER (ASCII) INTO A 10-BIT
               657; BINARY NUMBER.
               659
               660
                                              GET SEVENTH DIGIT
               661 CNVRT3: HOV
0364 7E
0365 0630
                662
                          SUI
                                 30H
                                              ; CONVERT
0367 6F
               663
                          MOV
                                L,A
0368 2600
               664
                          MVI
                                 H,00H
036A 22964F
                665
                          SHLD
                                 BYTE34
                666
                          LHLD
                                HPSAVE
036D 2A924F
                667
                          DCX
                                 н
0370 2B
                668
                                              .; GET SIXTH DIGIT
                          VON
0371 7E
                                 A,X
                669
                          SUI
                                 30H
0372 8630
                670
                          LXI
                                 H,LTIO
0374 21000C
                671
                          ADD
0377 85
                672
                          MOV
                                L,A
0378 6F
               673
0379 5E
                          MOV
                                 E, H
                674
               675
                          MVI
                                 D.OOH
037A 1600
037C 2A964F
                676
                          LHLD
                                 BYTE34
                          CALL
                                 WORDAD
037F CDB504
               677
                          SHLD
                                 BYTE34
03B2 22964F
                678
               679
                          ;
                                 HPSAVE
0385 2A924F
                680
                          LHLD
0388 2B .
               681
                          DEX
                                 Н
0389 2B
                682
                          DCX
                                 H
                                              GET FIFTH DIGIT
038A 7E
               683
                          MOV
                                 A,M
0389 29
                684
                          DCX
                                 H
                          SHLD
                                HPSAVE
038C 22924F
               685
                          SUI
                                 30H
                686
038F D630
                          ADD
                                 Α
               687
0391 87
                          LXI
                                 H,LT100
                688
0392 21000B
                          ADD
                                L
0395 85
               689
                          MOV
0396 6F
                690
                                L,A
0397 SE
               691
                          MOV
                                E,N
0398 23
               692
                          INX
                                 H
0399 56
               693
                          VOH
039A 2A964F
               694
                          LHLD
                                 BYTE34
                          CALL
                                 WORDAD
039D CDD504
               695
                          SHLD
03A0 22964F
               696
                                 BYTE34
               697
               698
               700; THIS ROUTINE CONVERTS A 4-DIGIT NUMBER (ASCII) INTO A 14-BIT
               701; BINARY VALUE.
               703
               704
               705 CHVRT4: LHLD.
03A3 2A924F
                                HPSAVE
                                            : GET CURRENT CONVERT DATA POINTER
03A6 7E
              - 706
                         MOV
                                              ;GET FOURTH DIGIT, LSB
                                A,H
03A7 D630
               707
                         SUI
                                30H
                                              ; CONVERT ASCII TO HEX
03A9 6F
               708
                         HOV
                                              ; PUT IN REG: L
                                L,A
03AA 2600
               709
                         ΜVΙ
                                Н,00Н
                                              ; ZERO-THE H REG.
                                              ; SAVE IN BYTEE 1 AND 2 LOCATION
03AC 22944F
               710
                         SHLD
                                BYTE12
```

J ŋ 3 ž, j-a ħŲ 11

	63	,	•	64
	711	;		•
03AF 2A924F	712	LHLD	HPSAVE	GET CONVERTER POINTEF
03B2 2B	713	DCX	H	(POINT AT THIRD DIGIT
03B3 7E	714	VON	A, N	;GET DIGIT
0 384 D630	715	SUI	30H	CONVERT TO HEX
03B6 21000C	710	FXI	H,LT10	PUT LOOK-UP TABLE BASE ADDRESS IN HL
03B9 85 ·	717	ADD	L	; INCREMENT: BASE TO APPROPRIATE MULTIPLIER
038A 6F	718	MOV	L.A	•
0388 5E	719	KOV	E,M	GET THE MULTIPLIER
03BC 1600	720	NVI	D,OOH	
03BE 2A944F	721	LHLD	BYTE12	GET CURRENT VALUE OF BYTEES 1 AND 2
03C1 CDD504	722	CALL	WORDAD	; ADD THE CURRENT VALUE TO THE PRODUCT
0304 22944F	723	SHLD	BYTE12	STORE THE NEW VALUE FOR BYTEES 1 AND 2
	724	ï		}-
03E7 2A924F	725	LHLD	HPSAVE	,
V3CA 2B	724	DCx	H	,
03C5 2B	· 72 7	DCX	H	
03CC 7E	728	MOV	A.M	GET SECOND DIEIT
03E5 D630 -	729	SUI	30H	; CONVERT
03CF 87	. 730	ADD -	A	
00D0 21000B	731	LXI	H,LT106	GET BASE ADDRESS
0303 85	732	ADD	Ł	OFFSET THE ADDRESS
03D4 6F	733	VOK	L,Á	
03D5 5E	734	VOM	E,H	GET MULTIPLIER
03D6 23	735	INX	H	
0307 56	736.	MOV	D,H .	
03D8 2A944F	73 7	LHLD	BYTE12	GET BYTEES 142
03D9 CDD504	738	CALL	WORDAD	ADD THE PRODUCT TO THE CURRENT VALUE
03DE 22944F	739	SHLD	BYTE12	STORE NEW VALUE
	740	;		
03E1 2A924F	741	LHLD	HPSAVE	,
03E4 2B	742	DCX	H	· 6
03E5 2B	743	DCX	H	
03E6 2B	744	DCX	H	
03E7 7E	745	MOV	A,H	GET FIRST DIGIT
03E8 2B	746	DCX	H	
03E9 22924F	747	SHLD	HPSAVE	,
02EC D=30	748	SUI	30H	CONVERT
03EE B7 (749	ADD	A	φ 5 1
03EF 21000A	750	LXI	H,LT1000	GET BASE ADDRESS
03F2 B5	751	ADD	L	OFFSET BASE
03F3 &F	752		L,A	
03F4 5E	753	MOV	E,N	GET MULTIPLIER
03F5 23	. 754	INX	H	,
03F6 56	755	KOV	0, M	in the second se
03F7 2A944F	756		BYTE12	GET CURRENT VALUE
03FA CD9504	757	CALL	WORDAD	;ADD THE VALUES
03FD 3EC0	758		A,OCOH	; INSURE THE FIRST TWO BITS OF MSB ARE SET
03FF B4 %	7:59		H	
0400-67	760	HOV.	H,A	
0401 22944F	761	SHLD	BYTE12	STORE FINAL VALUE OF BYTEES 1 AND 2
•	762	;		
'	763	;		•
	764 ;;;;	;;;;;;;;;;;	;;;;;;;;;;;;	
				REE DIGIT AREA CODE INTO A 2-BIT
	744 : 811	NARY CARE T	NIC DOUTING	ALCO COMPINES THIS VALUE WITH THE .

766 ; BINARY CODE. THIS ROUTINE ALSO COMBINES THIS VALUE WITH THE

```
65
                767; EXISTING VALUE OF BYTEES 1 AND 2.
                769
                770
0404 26924F
                771 CHVRTA: LHLD
                                   HPSAVE
0407 7E
                           MOV
                                   A,N
                                                 GET THIRD AREA CODE DIGIT
                772
0408 0630
                773
                           102
                                   30H
                                                 ; CONVERT TO HEX
040A 5F
                774
                           MBV
                                  E,A
                                                 ; PUT VALUE INTO REG. E
                775
                           LHLD
                                  HPSAVE
0408 2A924F
                776
                           DCX
040E 2B
                777
                                   H
040F 7E
                77B
                           VOK
                                  A.N
0410 D630
                779
                           SUI
                                   30H
                                                  ; CONVERT
0412 07
                780
                           RLC
0413 07
                781
                           RLC
0414 07
                782
                           RLC
0415 07
                783
                           RLC
                784
                           ORA
                                                 COMBINE THIS VALUE WITH E
0416 B3
                           VOX
                                                 ; REPLACE REG. E WITH NEW VALUE
0417 5F
                785
                                  E.A
                786
041B 2A924F
                787
                           LHLD
                                  HPSAVE
0418 28
                788
                           DCX
                                  Н
041C 2B
                789
                           DCX
                                  H
041D 7E
                790
                           MOV
                                                 GET FIRST AREA CODE DIBIT
                                  A.H
041E 2B
                791
                           DEX
041F 22924F.
                           SHLD
                                  HPSAVE
                792
                                                 CONVERT
0422 0630
                793
                           TUR
                                  30H
0424 67
                794
                           MOV
                                  H,A
                                                 ¡PUT INTO REG. H
0425 3EF0
                795
                           MVI
                                  A, AREA
                                                 ; PUT MSB BASE OF AREA CODE LOOK-UP TABLE IN A
0427 B4
                795
                           ORA
                                  H
                                                 ;OFFSET REG. H
0428 67
                797
                           MOV
                                                 ;H&L NOW HAVE ADDRESS OF 2-BIT AREA CODE
                                  H, A
0429 6B
                798
                           MOV
                                                 ; PUT LSB CURRENTLY IN REG. E. INTO L
                                  L,E
042A 7E
                799
                           MOV
                                                 GET 2-BIT AREA CODE
                                  A,M
                800
                           :
                                                 ;GET CURRENT VALUE OF BYTEES 1 AND 2
042B 2A944F
                108
                           LHLD
                                  BYTE12
                                                 COMBINE AREA CODE AND 14-BIT BINARY NUMBER
042E A4
                802
                           ANA
                                  Н
0425 67
                803
                           MBV
                                  H,A
                                                 PUT NEW VALUE INTO REGISTER H
0430 22944F
                B04
                           SHLD
                                  BYTE12
                                                 STORE FINAL VALUE
                805
                           ;
                806
                808; THIS ROUTINE TAKES FOUR ACSIL DIGITS, CONVERTS THEM INTO BINAFY
               .809 ; AND COMBINES THEM.
                812
0433 2A924F
                BL3 CHVRTD: LHLD
                                  HPSAVE
0436-7E
                814
                           HOV
                                  A,H
                                                GET FIRST DATA DIGIT
0437- D630
                815
                           SUL.
                                  30H
                                                ; CONVERT
                                                ; PUT INTO B
0439 47
                816
                           HOV
                                  B,A
                817
                           ;
043A-28
                818
                           DCX
                                  Н
                                                 ; SET SECOND DATA DIGIT
043B 7E
                819
                           MOV
                                  A,M
043C D630
                820
                           SUI
                                  30H
                                                 PUT 2ND BCD DIGIT INTO KSN
043E 07
                821
                           RLC
043F 07
                822
                           RLC
```

```
67
0440 07
                823
                           RLC
0441 07
                824
                           RLC
                                                 ; COMBINE REGISTERS A AND B
                825
                           ORA
0442 B0
                           MOV
0443 AF
                826
                                  L,A
                827
                           IVM
                                  H,00H
0444 2600
                                                 ; SAVE WORD #3, BYTES 7 AND 8
0446 229A4F
                828
                           SHLD
                                  BYTE78
                829
                                  HPSAVE
                830
                           LHLD
G449 2A924F
044C 28
                831
                           DCX
                                  Н
044D 28
                832
                           DCX
                                                 ; GET THIRD DATA DIGIT
                833
                           MOV
                                  A.K
044E 7E
                834
                           SUI
                                  20H
044F 0630
                835
                           VCH
                                  8.A
0451 47
                836
                837
                           DEX
                                  н
0452 ZB
                                                 GET FOURTH DATA DIGIT
6450 7E
                838
                           MOV
                                  A.M
0454 Be30
                837
                           SUI
                                  30H
0456 07
                840
                           RLC
0457 07
                841
                           RLC
0458 07
                842
                           RLC
                           RLC
0459 07
                843
045A B0
                844
                           ORA
                845
                           MOV
045E 6F
                                  L.A
                846
                           ΝVΙ
                                  H, OOH
045C 2600
                                                 STORE BYTES 5 AND 6, WORD #2
                847
                           SHLD
                                   BYTE55
045E 22984F
                848
                849
                851; THIS ROUTINE TRANSFERS THE CONVERTED DATA PACKET TO THE DUTPUT
                852; BUFFER.
                854
                · 855
0451 2ABA4F
                856
                           LHLD
                                   CHVRTP
                                                 GET OUTPUT BUFFER POINTER
                                                : PUT INTO REGITERS DAE
0464 EB.
                857
                            XCHG
                858
046E 2A944F
                - 859
                           LHLD
                                   BYTE12
                                                 GET FIRST TWO BYTES
04c8 7D
                 860
                            YON
0469 12
                 861
                            STAX
                                   Đ
6454 13
                 862
                            INX
                            MOV
046B 7E
                 863
                                   A,H
0460 12
                 B64
                            STAX
                                   D
                            INX
04oF 13
                 865
                 866
                            ;
                                                  ; GET SECOND WORD
046E 28964F
                 867
                            LHLD
                                   BYTE34
                           MOV
                                  A.L
0471 70
                868
                869
                           STAX
                                  D
0472 12
0473 13
                870
                           INL.
                                  D
0474 7C
                871
                           YON
                                  A,H
0475 12
                872
                           STAX
                                   D
0476 13
               · 873
                           INX
                 874
                                                 GET THIRD WORD
                           LHLi
                                   BYTE5a
                875
0477 2A984F
                            VOX
                                   A.L
047A 7D
                 876
                                   D
                877
                            STAX
0478 12
047C 13
                            INY
```

E. C. E.

MOV

A.H

879

0470 7C

70

MOV

934

0489 70

```
935 OLP1:
                         DCR
04BA 15
                                NOWADE
04BB CACAJ4
                          JΖ
               936
04BE 17
               937
                         RAL
                                OLP1
                          JNC
               93B
04BF D2BA04
                                L,A
                         HOV
04C2 6F
               939
                                 A,H
                          HOV
04E3 7E
               94ŭ
               941
                         RAL
0404 17
                          MOV
                                 H,A
               942
0405 67
               943
                          X0%
                                 A.L
0406 70
                                 OLPI
                          JMP
04C7 C3BA04
               944
               945
               946 NOWADD: XCHG
04CA EB
                          LHLD
                                 VALUE
               947
04CB 2A9C4F
                          MOV
               948
                                 A,L
04CE 70
                          ADD
                                 Ε
04CF 83
               949
               950
                          MOV -
                                 L,A
04D0 oF
               951
                          NOV
                                 6,8
04D1 7C
                          ADC
                                 D
                952
04D2 8A
                          MOV
0403 67
               953
                954
04D4 C9
               955 DONE:
                          RET
                956
                957
               959; THIS ROUTINE ADDS TWO 16-BIT, WORDS. -
                960; ONE WORD SHOULD BE PLACED IN THE DAE REG. AND THE OTHER IN THE
                961 ; H&L REG.
                962 ; THE RESULT (SUM) IS RETURNED IN THE HAL REGISTERS.
                964
                965
                966 WORDAD: MOV
                                 A,E
0405 78
                          ADD
                                 L
                967
04D6 85
                          MOV
                                 L.A
04D7 6F 1
                968
                          HOV
                                 A, D
04D8 7A
                969
                          ADC
                                 Н
04D9 8C
                970
                971
                          HOV
                                 H, A
04DA 67
04D8 C9
                972
                          RET
                973
                974
                          ï
                975
                          END
                975
```

PUBLIC SYMBOLS

EXTERNAL SYMBOLS

USER SYMBOLS				· .		
ACKFLG A 4FAo	ADATA A 9000	ADDRES A 4FBA	AREA A 00F0	ASTAT A 9005	BAD A 0216	BADIRĈ A 0178
BADR A 0130	BAUDLS A 7000	BAUDMS A 9001	BEGIN A 0046	BITS A 032A	BUFFER A 4000	BYTE11 A 4F94
BYTESA A 4F7c	BYTES& A 4F98	BYTE78 A 4F9A	CMD1 A 0302	- CMD2 A 030D	CMCJ	CHOOLT A JOFE
ENTEL A 4FAC	CNVBUF A 4F9E	CNVRT3 A 0364	CNVRT4 A 03A3	CNVFTA A 0404	CHVRTD A. 0430	CNVFTH A 4F6E
CHURTE H AFBA	CONT A 0204	CONTR A 0121	CPORT4 A 0013	CPORTS.A 0023	CRTBUF A 4F3o	CURPEN A 4FBI
DATANA A 4FBD	DATERE A 916D	DISINF A 9601	DONE A 0454	DR _ A 032D	DTAXS A 0007	ELPI Á U4A&
EVEN A 0463	SETBYT A DIDE	GETID A 4F57	6000R Asj013F	HPCNVT A 4F90	HPLOP1 A 024C	RPLOPI A 0253
HPOLT A 023E	HPSAVE A 4F92	182501 A 0299	182502 A 02DC	18255 A 0348	18273 A 02ED	ID A 4F86

	73		74	
INBYTE A 5180 INCOME	A 4FA4 INPDAT A 010	07 - IXMIT A 0333 - L	LCR A 9003 LT10 A 0000	LT100 A 0500
LT1000 A 0A00 MLSOP	A 0067 HLOOF2 A 006	AD MLDOF3 A 0090 I	MRESET A 001F MSTOP A 002F	MULTI A 049F
MULRUN A COFF MUXWR	A DOGO - NENCON A GIO	CA NEWPAC A 0188 N	NOWADD A 04CA - GDD A 0486	OFFSET A 0350
OLP1 A 045F OPMODE	A 0321 – BUTACK A 016	ED OUTBYT A 0232 (OUTCRT A,0281 OUTDON A 026A	OVERFL A DOFa
PACKET A 4FAC POINTI	4 4FAI — POINTO A 4FA	NO PORTAN A 0010 F	PORT48 A 0011 PORT4C A 0012	PORTSA A 0020
FUTLE A 0290 RAM	A 4000 RCV A 032	2F →REALDT A: 0194 - F	RECON®A ÓG7E RESET A EGGÓ	RESULT A 6001
RELOF A 0187 RETAT I	4 014B RSTATL A 015	79 RAIR A 6003 S	SAMEPC A 01Å9 SAMPAC A 4FSE	SCHORG-A 6000
SDATAL A BOOD SDATAD	A 7000 SMBDES A 032	24 SPRMRG A 6001 1 5	SSTAT A 6000 START A 005:	STATLE A VOIC
STATUS A 4FBS -TL1	4 0047 - TOPOUT A 402	6 TURNON A 0224 1	TX1 A DOES TXBYTE A 4FBC	TXCONT A 00EE
TXFLG A 4F6C TXIF	4 6002 - TXLOOF A 008	EE TXPNT A 4FBD 1	TXSTAT A 4FAS — TXSTRT A 0069 1	VALUE A 4F3C
wordad a 0405 / XMIT i	A AFAT		· · · · · · · · · · · · · · · · · · ·	•

4,755,872

ASSEMBLY COMPLETE, NO ERRORS

What is claimed is:

1. A method for implementing telephone-based purchase requests by a subscriber, said subscriber having a 20 telephone unit served by a telephone company central office, said telephone company central office using a computer which, in response to a telephone call from the subscriber, provides a calling line data message which includes an origination telephone number for the 25 calling subscriber and destination telephone number data entered by the calling subscriber via his telephone unit to indicate said purchase request, comprising the steps of:

electronically receiving a calling line data message 30 from the telephone company central office;

applying first information representing the origination telephone number of the subscriber directly to a system controller at an operator station, said system controller having access to authorization 35 information editable by a billing system concerning the eligibility of the subscriber for said purchase

determining from said first information and said authorization information whether the subscriber making the request is eligible to make the purchase;

if said determining step indicates that the subscriber is eligible for said purchase, then executing the resystem.

The method of claim 1 wherein said receiving step is done in real time at said telephone company central office and the method further includes communicating only a portion of said received calling line data message 50 to said operator station.

3. The method of claim 2 including buffering said portion of said calling line data message at said telephone company central office.

4. The method of claim 3 including receiving said 55 calling line data message asynchronously and communicating said portion of said calling line data message synchronously to said operator station.

5. A method of implementing telephone-based pay per view requests by subscribers to view pay per view events, each of said subscribers having an addressable access terminal unit, each subscriber having a telephone unit, said telephone units being served by telephone company central offices, each of said telephone company central offices using a computer which, in re- 65 sponse to a telephone call from a calling subscriber, provides a calling line data message which includes an origination telephone number for the calling subscriber and destination telephone number data entered by the

calling subscriber via his telephone unit to indicate a pay per view request, comprising the steps of:

electronically receiving a plurality of calling line data messages from respective calling subscribers at plural telephone company offices;

electronically transmitting at least the origination telephone number portion and the destination telephone number data portion of each of the calling line data messages to a headend station;

electronically receiving said origination telephone number portion and said destination telephone number data portion of each of said calling line data messages at said headend station and applying said telephone number portions directly to a system

locating, using said system controller, stored data indicating whether said calling subscribers are eligible to view the requested pay per view events, at least a portion of said stored data having been responsive to input from a billing system, said locating step occurring at said headend station and employing said telephone number portions; and

addressing and updating data stored in the calling subscriber' access terminal units if said stored data indicates that said calling subscribers are eligible to view the requested pay per view events.

6. The method of claim 5 wherein the step of elecquest and indicating the transaction to a billing 45 tronically receiving a plurality of calling line data messages at each of plural telephone company central offices occurs in real time and the method further includes buffering said portions of the calling line data messages at each of the telephone company central offices.

7. The method of claim 6 including providing communication units located at respective telephone central offices to receive said calling line data messages, strip data therefrom to provide compressed data, said compressed data including said portions of calling line data messages, providing corresponding communication controllers located at said headend station, and transmitting said compressed data to said corresponding communication controllers.

8. The method of claim 7 including buffering said portions of the calling line data messages at said communication controllers and multiplexing said portions of the buffered calling line data messages to apply them to said system controller.

9. The method of claim 7, further comprising a data conversion step occurring at said communication con-

10. The method of claim 8 wherein said multiplexing step includes sequentially addressing each of said communication controllers and permitting each addressed controller to communicate said buffered data for a time which depends on the time required for a communication controller to communicate all of its buffered data ready for output.

11. The method of claim 10 wherein when each of said communication controllers is addressed, if it has buffered data ready to be communicated, an interrup-

tion of said sequentially addressing occurs.

12. The method of claim 11 wherein said multiplexing 10 step includes sequentially addressing said controllers with a multiplexer and communicating buffered data from said controllers to said multiplexer, the method further including buffering data at said multiplexer.

13. The method of claim 12 wherein after said multiplexer addresses a communication controller, the addressed communication controller interrupts said sequential addressing and verifies that the address outputted by said multiplexer after said sequential addressing has been interrupted is the address of said addressed communication controller, and if so, thereafter communicates buffered data to said multiplexer.

14. The method of claim 11 including refraining from said interrupting said step of sequentially addressing if the addressed controller determines that data is to be 25

inputted thereto.

15. The method of claim 12 wherein said step of sequentially addressing is interrupted if inadequate buffer-

ing capability exists at said multiplexer.

16. The method of claim 9 wherein the origination 30 telephone number portion of a calling line data message includes a plurality of ASCII digits and wherein said data conversion step includes converting said ASCII digits into a binary number.

17. The method of claim 16 wherein two of the 35 ASCII digits are converted into a binary number by:

subtracting 30 hexadecimal from the ASCII digit in the one's place to produce a one's place binary value;

subtracting 30 hexadecimal from the ASCII digit in 40 the ten's place to produce a ten's place binary value;

combining the ten's place binary value with a ten's place look-up table base address to produce a ten's place look-up table address;

addressing a look-up table with the ten's place lookup table address to produce a weighted ten's place binary value; and

adding the weighted ten's place binary value to the one's place binary value to produce the binary number equivalent to the two digit ASCII number.

18. The method of claim 16 wherein the origination telephone number portion of a calling line data message includes a three digit ASCII number representing the area code of a calling subscriber and wherein the three digit ASCII area code number is converted into a two bit binary value by:

subtracting 30 hexadecimal from the first ASCII digit to produce a first binary value;

subtracting 30 hexadecimal from the second ASCII 60 digit to produce a second binary value;

rotating the second binary value left four places to produce a rotated second binary value;

adding the first binary value to the rotated second binary value and storing the sum in a first register 65 location:

subtracting 30 hexadecimal from the third ASCII digit to produce a third binary value;

adding a look-up table base address to the third bi-

nary value and storing the sum in a second register location:

combining the values stored in the first and second register locations to produce a register pair; and addressing a memory with the register pair to locate the two bit binary value corresponding to the ASCII area code value.

19. A method for executing a telephone-based pay per view ("PPV") request to view an event in a system having a headend station and numerous subscribers remotely located from said headend station, said subscribers having telephone units served by plural telephone company central offices and having one-way addressable access terminal units, comprising the steps of

receiving calling line data messages from Automatic Number Identification ("ANI") computers coupled to the plural telephone company central offices, each of said calling line data messages including an origination telephone number for a respective calling subscriber making a PPV request and a destination telephone number entered by the calling subscriber via his telephone unit to indicate a PPV request, said receiving step occurring at each of said telephone company central offices in real time:

stripping unnecessary data received from said ANI computers and buffering the resulting data at units associated with respective central offices; then

separately communicating said resulting data from each of said units to corresponding communication controllers located at the headend station;

converting the format of data received by said communication controllers and temporarily storing converted data thereat;

communicating said converted data from said communication controllers directly to a system controller at the headend station at a high transfer rate, said system controller having stored data therein for said subscribers, said stored data having been responsive to input from a billing system;

locating said stored data for said calling subscribers by using said origination telephone numbers and determining whether said stored data indicates that said calling subscribers can view said PPV event; and

communicating address codes and authorization codes to said addressable access terminal units.

20. The method of claim 19 further including communicating a transaction to said billing system after said last-named communicating step, and wherein said resulting data includes both origination and destination telephone numbers.

21. A system for executing a telephone-based per pay per view (PPV) request, the system having a headend station and numerous subscribers remotely located from the headend station, said subscribers having telephone units served by a telephone company central office and having one-way addressable access terminal units, comprising:

a receiving circuit coupled to an Automatic Number Identification (ANI) computer at the telephone company central office for receiving message data representing a request from a calling subscriber, said data including the calling subscriber's telephone number and data representing an event as to which a transaction is requested by the calling subscriber;

- a communication link between said receiving circuit and the headend station;
- a system controller located at the headend station for electronically mapping the telephone number portion of said message data into subscriber data stored in said system controller, said subscriber data including eligibility data indicating whether the calling subscriber is eligible to receive the event;
- a billing system coupled to said system controller, said billing system being able to alter said eligibility data:
- a coupling circuit coupling said message data directly to said system controller, said system controller determining from said eligibility data and said message data whether the calling subscriber is eligible to view said event and if so, then authorizing said addressable access terminal units to be addressed;
- an encoding circuit responsively coupled to said system controller for communicating with the access terminal units associated with said calling subscriber.
- 22. The system according to claim 21 wherein said receiving circuit includes means for stripping unnecessary data from said message data and a buffer coupled to said means for stripping for temporarily storing data to be transmitted over said communication link.
- 23. The system of claim 22 including means for synchronously communicating data over said communication link.
- 24. The system according to claim 21 wherein said headend station includes means for buffering data received via said communication link.
- 25. The system according to claim 21 wherein said coupling circuit includes a communication controller coupled to said communication link.
- 26. The system according to claim 25 wherein said communication controller includes means for buffering 40 data received via said communication link and further includes means for converting into binary form the data representative of the telephone number of the subscriber and for coupling said binary form data to said system controller.
- 27. A system for executing telephone-based pay per view (PPV) requests to view an event, the system having a headend station and numerous cable subscribers remotely located from said headend station, said subscribers having telephone units served by plural telephone company central offices, each subscriber having at least one one-way addressable access terminal unit, comprising:
 - plural circuits for receiving data representing calling subscriber requests, including the calling subscriber 55 telephone numbers, from Automatic Number Indentification (ANI) computers associated with the telephone company central offices;

plural communication links each arranged for coupling a respective one of said circuits for receiving 60 to said headend station;

- a system controller at said headend station;
- a coupling circuit at said headend station for coupling said calling subscriber telephone numbers to said system controller; said system controller being 65 operable to map said subscriber telephone numbers into subscriber data, said subscriber data including eligibility data indicating whether the calling subscribers are eligible to receive the requested event;
- a billing system coupled to said system controller,

said billing system being able to alter said eligibility data; said system controller determining from said eligibility data whether the calling subscribers are eligible to view the requested event; and

an encoding circuit responsively coupled to said system controller for communicating authorization codes to the access terminal units of the calling subscribers.

- 28. The system according to claim 27 wherein each of said circuits for receiving includes a buffer for storing data
- 29. The system according to claim 28 wherein each said circuit for receiving further includes means for stripping unneeded information from the data received from said ANI computer, said means for stripping being coupled to said buffer.
- 30. The system according to claim 27 wherein said coupling circuit includes means for buffering data received at said headend station via said communication link.
- 31. The system according to claim 27 wherein said coupling circuit includes plural communication controllers each coupled via a respective communication link to a respective circuit for receiving, and coupled also to said system controller.
- 32. The system according to claim 31 wherein each of said communication controllers includes means for buffering data received via its corresponding communication link.
- 33. The system according to claim 32 wherein each communication controller includes means for converting data received via said communication link into binary data.
- 34. The system according to claim 33, wherein said coupling circuit further includes a multiplexer coupled to each of said plural communication controllers and to said system controller.
- 35. The system according to claim 34 wherein said multiplexer includes means for sequentially addressing said communication controllers, and wherein each communication controller includes means responsive to a preselected address generated by said multiplexer, means for interrupting said sequential addressing by said multiplexer, each of said communication controllers being responsive to said interrupting for transferring temporarily stored data to said multiplexer.
- 36. The circuit according to claim 35 wherein each of said communication controllers includes a respective logic means for determining whether data received via said communication link is good data and for acknowledging to a corresponding circuit for receiving the receipt of good data, for converting the received data into binary data, and for loading said converted binary data into said buffer to await transmission to said multiplexer.
- 37. The system according to claim 36 wherein said multiplexer includes a counting circuit having an output, said system including a bus for coupling said counting circuit output to each of said communication controllers, each of said communication controllers, each of said communication controllers including means for providing a predetermined count and including a comparison circuit for producing an equality signal when said counting circuit output is equal to said predetermined count, said logic means being responsive to said equality signal to enable a stop signal, said stop signal being coupled to said counting circuit and said counting circuit being inhibited when said stop signal is enabled.

38. The system according to claim 37 wherein said logic means is operative for checking the counting circuit output after said counting circuit stops, and for transferring data from said communication controller to said multiplexer if the counting circuit output after said counting circuit has stopped corresponds to the predetermined count within said communication controller.

39. The system according to claim 36 wherein said logic means is operative to cause the transfer of all converted data stored in said buffer in said communication.

logic means is operative to cause the transfer of all converted data stored in said buffer in said communication controller to said multiplexer after said multiplexer has been interrupted from further sequential addressing.

40. The system according to claim 35 wherein said multiplexer includes a temporary storage device and a

logic circuit coupled to said temporary storage device, said storage device being coupled to an input of said multiplexer, said input being coupled to each of said communication controllers, said logic circuit being operative for temporarily storing data received at said

input in said storage device.

41. The system according to claim 40 wherein said multiplexer includes means associated with said storage device for indicating when said storage device has reached a predetermined level regarding its storage capacity, said means for indicating being coupled to said means for sequentially addressing communication controllers, said means for sequentially addressing being responive to said means for indicating to interrupt the sequential addressing.

42. The system according to claim 31 wherein said 30 system controller includes an input buffer and an output buffer, said input buffer being coupled to receive a set of data words representing said subscriber requests, said system controller processing data taken from said input buffer and determining said address codes and said authorization codes corresponding to the subscriber requests, and providing said codes to said output buffer.

43. The system according to claim 42 wherein said system controller includes first and second input buffers and first and second output buffers, said system controller controlling said input and output buffers for receiving data from said communication controllers at one of said input buffers while processing data contained in other of said buffers; said output buffers communicating with said encoding circuit, one of said output buffers 45 being operable for receiving data processed by said system controller while the other of said buffers is communicating data to said encoding circuit.

44. A system for executing telephone-based pay per view (PPV) requests from subscribers to view a PPV 50 event, the system having a headend station and numerous subscribers remotely located from the headend station, said subscribers having telephone units served by a telephone company central office and having oneway addressable access terminal units comprising: 55

- a plurality of communication units each located at a respective telephone company central office and each communicating with a respective ANI computer for receiving calling line message data therefrom including the telephone number of each subscriber calling said telephone company central office with a request to view said PPV event and a destination telephone number which indicates said PPV event;
- a plurality of communication controllers located at 65 said cable headend station, each corresponding to a respective communication unit;
- a plurality of first communication links for coupling

each of said communication units to its corresponding communication controller;

a second communication link coupled to all of said communication controllers for receiving data therefrom, including the telephone numbers of said subscribers who have called to request said event;

a system controller directly coupled to said second communication link for receiving data therefrom and for mapping said telephone numbers into respective blocks of stored data each of which includes, for the respective subscriber, the subscriber's access terminal unit address and eligibility data indicative of whether the calling subscriber may view said PPV event, said blocks of data being stored in said system controller;

an encoding circuit responsively coupled to said system controller for communicating data to the access terminal units of those subscribers whose said eligibility data indicates that they are entitled to

view said PPV event;

a billing system coupled to said system controller for

updating said eligibility data;

each of said communication units including a logic means responsive to the receipt of data from the corresponding ANI computer for stripping therefrom unnecessary data, each of said communication units including a storage device, said logic means being operable to store data remaining after said stripping in said storage device;

each of said communication controllers including logic means and a storage device, said logic means being operative for causing data received at said communication controller via the corresponding first communication link to be stored temporarily in said storage device and for converting the for-

mat of data into binary form.

45. The system according to said claim 44 wherein said second communication link comprises a multiplexer which includes means for sequentially addressing each of said communication controllers and means for interrupting said sequentially addressing means; wherein the logic means in each of said communication controllers determines that said communication controller is being addressed by said multiplexer and, in response, activates said means for interrupting said sequential addressing until after the transfer of temporarily stored data from said communication controller to said multiplexer.

46. The system according to claim 44 further including means for communicating to said billing system data representative of said PPV requests which have been mapped by said system controller thereby to adjust data for the subscriber to reflect their PPV requests which

have been processed.

47. The method of claim 1 wherein said applying step comprises mapping the subscribers origination telephone number into a block of data concerning the subscriber, said block indicating whether the subscriber is eligible to make the requested purchase, at least a portion of said block of data corresponding to said information received from said billing system; said comparing step comprising determining the contents of a portion of said block of data.

48. The method of claim 47 further comprising buffering said calling line data message at said telephone company central office; stripping data from said calling line data message; and transmitting the remaining data after said stripping step to said operator station; said

mapping step occurring at said cable operator station.
49. The method of claim 1 wherein said authorization information is located in said system controller.

50. The method of claim 1 wherein said authorization information comprises a flag which is editable by said 5 billing system.

51. The method of claim 5 wherein said stored data is located in said system controller.

52. The method of claim 51 wherein said stored data comprises a flag and wherein said billing system is operable to edit said flag from time to time.

53. The method of claim 9 wherein said communication units strip unnecessary data from said calling line data messages to provide compressed calling line data; and wherein said communication controllers reorganize 15 said compressed calling line data and convert the format thereof into one or more binary formats.

54. The method of claim 53 wherein each of said communication controllers:

converts the origination telephone numbers which it 20 receives by reading a look-up table for a first portion of each respective origination telephone number to provide a first binary number;

converts a second portion of the origination telephone number into a second binary number; and '25 combines said first and second binary numbers into a third binary number which it communicates to said system controller.

55. The method of claim 19 wherein said stored data inlcues a flag which is able to be updated from time to 30 time by said billing system.

56. The method of claim 21 wherein said eligibility data comprises a flag.

57. A method for implementing telephone-based pay per view ("PPV") requests by subscribers to view a 35 PPV event, each said subscriber having a telephone unit served by a telephone company central office and having an addressable access terminal unit, said telephone company central office using apparatus which, in response to a telephone call from the subscriber, provides a corresponding calling line data message which includes the origination telephone number for calling subscriber and the destination telephone number data entered by the calling subscriber via the subscriber's telephone unit to indicate the PPV request, comprising 45 the steps of:

electronically receiving calling line data messages from the telephone company central office in a first data format:

stripping unnecessary data from said each calling line data message to provide a plurality of compressed data messages each of which includes the origination telephone number and said destination number of a calling subscriber;

temporarily storing said plurality of said compressed 55 data messages:

transmitting said plurality of compressed data messages via a communication link to a headend office; receiving said plurality of compressed data messages at a communication controller at said headend station; converting the format of the portions of said compressed data messages which include the origination telephone numbers received by said communication controllers into binary format, including finding a first binary number in a look-up table for a first portion of an origination telephone number, converting a second portion of said origination telephone number into a second binary number, and converting a third portion of said origination telephone number into a binary format; said communication controller also converting said destination telephone number into a binary format; and

communicating said binary numbers directly to a system controller, said system controller locating, from each said origination telephone number, a data block for the corresponding calling subscriber, said data block including a flag which indicates whether said calling subscriber may receive said PPV event; said data block flags being editable by a billing system; said system controller updating the addressable access terminal unit of a said calling subscriber if the corresponding said flag indicates that said calling subscriber is eligible to view said PPV event.

58. The method according to claim 57 wherein said destination telephone numbers are converted into binary coded decimal and wherein said system controller uses said first and second binary numbers to look up further information to find said data block.

59. The method according to claim 57 wherein said communication controller consults a look-up table to determine a first number of binary bits indicating the area code of said origination telephone number, consults a look up table to determine a second number of binary bits indicating a second portion of said telephone origination number, and combines said first and second binary numbers.

60. The method of claim 57 wherein said data blocks are stored in said system controller.

61. The method of claim 1 wherein said applying step includes receiving information at first and second input buffers alternately, said system controller performing said comparing step on information which has been stored in one of said input buffers while information is being received at the other said input buffer, said system controller loading processed data into first and second output buffers alternately, the method further comprising communicating said processed data from said output buffers to an encoding circuit, one of said output buffers communicating with said encoding circuit while the other said output buffer receives said processed data from system controller.

62. The system of claim 27 wherein said subscriber data is stored in said system controller.

63. The method of claim 1 wherein said purchase requests are for pay per view video events, wherein said subscriber has an addressable access terminal unit and wherein said executing step comprises addressing said access terminal units to permit the pay per view event to be viewed.

APPLICATIONS

FROM THE EARLY tape storage devices to today's sophisticated speech generation systems, the keys to the acceptance of voice response technology have been ease of use and cost savings for the end user.

The first voice response systems of a generation ago provided direct data-base access for people working in the branch offices of banks and other financial institutions. These systems allowed access from remote locations to such information as account balances and credit lines. They did so without the expense of computer terminals or special communication lines, using standard push-button telephones.

During this same period; consumers began to deal with computers that could talk. Such interactions took place primarily through telephone installations for reporting misdialed and changed phone numbers. But financial institutions also entered the talking computer arena through bill-paying and bank-from-home services. These services were an early and important step in reducing the amount of paper handled and also permitted routine transactions to be serviced with fewer personnel and branch offices. Bank-from-home systems preceded the now common automatic teller machines by several years.

Two recent innovations in voice response technology have made it more usable and acceptable to a variety of users. These are the ability of a single system to handle both voice and data on the same communications line and the ability of a user to change the transaction content and the actual spoken responses.

By treating the telephone as just one of several input devices to a system, voice response enhances the user's operation instead of working as a separate entity. The system automatically determines the type of device on the line and selects the appropriate response medium—speech or data. Thus all input points can be serviced through a single system and all inputs to the mainframe computer converted into the proper format.

One Line for Voice and Data

A good example of the benefits of handling voice and data on one set of telephone lines is in credit authorization applications. In this case, a credit card issuer may need to certify a sales authorization by telephone

from some locations, but through special terminals or electronic cash registers from others. Handling both types of authorization over one set of lines leads to economies of scale.

For retail stores, a more important feature of such a system is that no recalls are necessary when a problem occurs. The credit card issuer simply sends a "pick up the phone" message to the terminal—which can be displayed as a special response code. The system switches to the voice mode as soon as the sales clerk comes on the line.

Thus, the communications system is easy for retailers to use.

With the appropriate system, a user can modify the manner in which the system manages different types of transactions, and he can modify the messages and responses at any time. These capabilities are particularly important in nonfinancial applications in which seasonal and detail changes are frequent. For example, assume a company wishes to change the way its system answers the phone from "hello" to "season's greetings." In addition, it may want to

Voice Response Systems— Technology to the Rescue for Business Users

A variety of business messages and transactions are simplified when voice response technology takes over the telephone lines.

S. Thomas Emerson

President
Periphonics Corporation
Bohemia, NY.

change the description of an item from "shipped in cases of six" to "shipped in cases of twelve." If the system doesn't allow the user to change messages, he must return to the system manufacturer for changes, which will likely be costly and time-consuming.

Simple authorization of an action is one application area turning increasingly to voice response technology. Systems being installed today can authorize the acceptance of credit cards and checks, repairs under warranty and the shipment of merchandise.

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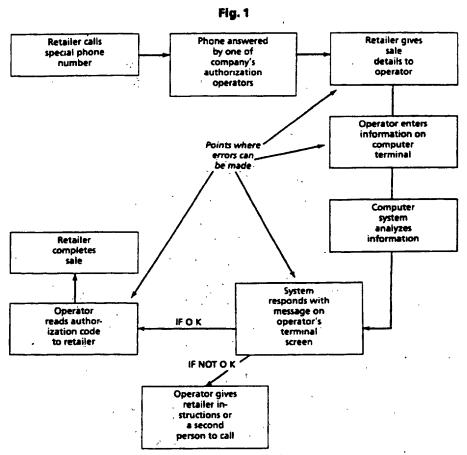
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FOR INFORMATION CIRCLE 126 ON READER CARD



Without a voice response system, credit card authorization is a complex, costly, and errorprone process. Most errors result from the "human interface"—data is incorrectly entered by an operator or incorrect data is given to the caller.

Credit card authorizations illustrate how voice response technology gives users system flexibility at dramatically reduced costs. Issuers of credit cards are subject to fraud and misuse of the cards. To prevent such actions, they set up a complex and costly procedure for verifying each use of a card. For small sales—low dollar amounts—cards are checked by sales clerks using periodically published listings of "hot" (stolen) cards. High dollar amounts must be confirmed by telephone calls to authorization centers—which are rooms full of operators answering phone calls and entering data into computer terminals (Fig. 1).

This process is both costly and cumbersome. Staffing an authorization center to deliver service when it is needed presents logistical problems, supervision difficulties, and high equipment costs. The problems are magnified in terms of idle equipment standing by to work at peak times or during peak seasons.

To eliminate some of these problems, issuers have installed either direct authorization links to electronic cash registers or have special authorization terminals. But these provide only a partial solution. Electronic registers are located only at high-volume sales points, and terminal networks are expensive to purchase and to service. Furthermore, neither completely eliminates the need for authorization centers.

Voice response technology, either in combination with terminals and electronic cash registers or acting alone, gives a credit card issuer the means to completely automate his entire operation. Moreover, the

APPLICATIONS

issuer need only maintain a small staff to handle difficult or unusual calls.

How the Voice Response System Works

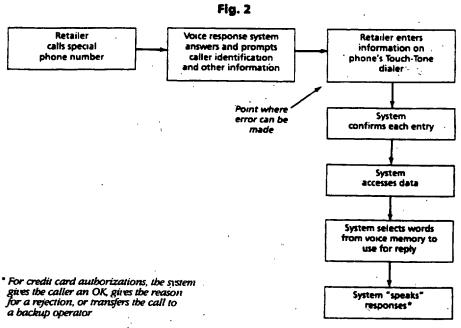
When a call comes in on a voice response system, the system must be able to determine whether it is a voice or a data call (voice and data enter on the same set of lines). The system then automatically switches to the appropriate communications mode.

As illustrated in Fig. 2, a Periphonics system answers the phone and "speaks" a predetermined greeting by selecting words and phrases from its digital memory. Then, depending on the system's function, it may request the caller's identity—a customer or user number—and ask what information the caller needs. In an order entry system, for example, the question could be whether the caller wants to enter, cancel or check the status of an order. The caller responds by way of the Touch-Tone dialer on his phone, entering the code number or letter for the functions he or she wants to perform.

Once the voice response system identifies the caller and his needs, it must locate the necessary data base, which is either in its own memory or in that of another computer system. It does so by converting the Touch Tone inputs into the format of the proper data base. The system then accesses memors in a manner similar to that used by a standard computer terminal. When data are returned, the system uses predetermined instructions to formulate an answer for the caller. The words and phrases are drawn from its own memory. An answer is "spoken" over the phone, followed by a second set of prompts to continue the transaction. This sequence of operations is repeated until the reason for the call is satisfied. Some systems can also switch the caller to an operator if the system cannot fulfill the caller's request.

At the core of the Periphonics system is the T-Comm 80, an intelligent communications processor. Designed for total network control, the processor provides host-software compatibility and makes terminal communications completely independent of the host processor. The latter permits the host to concentrate on its primary task, processing data.

FComm 80 can support any combination of voice response lines, plus asynch-



A much simpler credit card authorization process is possible using a voice response system. Here, a person enters the loop only in the few instances in which the electronics portion cannot provide the necessary information. Note that there is only one point where human errors can be made and that confirmation should virtually eliminate them.

ronous, synchronous, or SDLC (Synchronous Data Link Control) terminals from different vendors. It converts all these into a common interface and access method with the host computer. It also supports communications with and between up to seven independent host systems, either through channel attachments or through a communica-

tions port. Message switching is based on the originating terminal or message content. In any case, there is no need for host intervention.

A Voice Response Application -

A major oil company with credit card



DR S. THOMAS EMERSON is the president of Periphonics Corporation, a leading manufacturer of voice response systems. A founder of the company, he hold several patents covering its speech storage and generation technology. Earlier, Dr. Emerson held a research position with Brookhaven National Laboratory, Upton, NY. He earned a BS degree in physics from the Massachusetts Institute of Technology and MA and PhD degrees in physics from Rice University.

Making a Computer Talk

THE TWO KEY FACTORS in the commercial acceptance of a voice response system are the quality of its voice and the system's ability to accurately and economically issue spoken responses to a large number of telephone lines simultaneously.

To create a high-quality system voice, Periphonics employs a five-step process. The process is built around special recording studios and equipment designed primarily for that purpose. First, starting with a script of all phrases and words that the system needs to "speak," trained audio technicians reduce the script to its recording format. That means eliminating all redundancies and duplications. Second, the recording script is recorded by a trained speaker. During the recording session, each word—called an audio item—is recorded about 15 times.

Third, using special equipment, the recorded words and phrases are electroni-

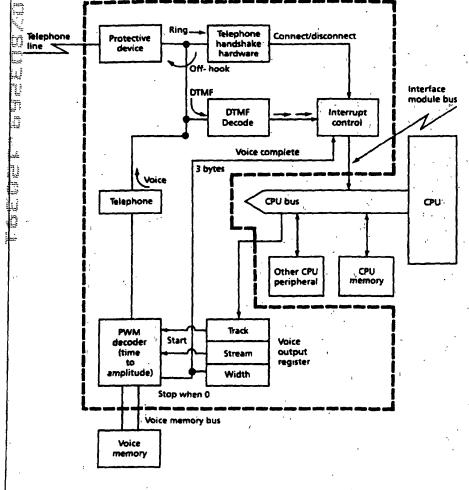
cally edited. Then the best version of each word or phrase is selected for actual system use and adjusted for pitch, tone, and volume. Fourth, the final recorded version of the words and phrases is edited further to eliminate extraneous voice and mouth sounds and adjusted to the bandwidth of the telephone system.

At this point, the recording is still in an analog-signal format. In the fifth step, through a special encoding process, the analog signals are converted into digital form and stored on floppy disks, each holding about 24 seconds of speech. The disks ("diskettes") are used to load the vocabulary into the system's solid-state memory.

High-quality digitized speech requires high data transfer rates—typically 56 kbits/s for each connected phone line. An independent voice response controller manages; the transfer of this digital data. The ability of the voice response controller to provide parallel data transfer to many connected telephone line interfaces is essential for a system which can hold many simultaneous "conversations" without degrading the quality of speech or any single line.

The central processing unit receives decoded DTMF tone inputs from the individual telephone line interface cards. It "speaks" the response to the appropriate telephone line by providing the voice response controller with parameters which specify voice response vocabulary items to be played back. A vocabulary item can vary in duration from 135 ms to 17 s and is specified to the voice controller by just 3 parameter bytes received from the CPU. Sentences are composed of concatenated items.

The voice memory is organized into tracks and streams as shown. Each track contains 17 s of speech information. Tracks are composed of streams, each containing 135 ms of speech information. Thus 128 streams make up one track. Track information is fed to a PWM (pulse-width modulation) decoder which converts time-varying signals into amplitude-varying signals suitable for transmission over the phone lines.



APPLICATIONS

operations in the Midwest was handling 300,000 calls a month at its authorization center. That required a staff of 44 operators, plus supervisors. The authorization process contained four critical points that are subject to errors, and three out of the four were subject to human error (see Fig. 1 again).

With the cost of gasoline rising, the oil company was faced with two obvious choices. The first was to rapidly increase the center's capacity. That would require additional staff, more equipment, and larger facilities. The second choice was to raise the "floor limit"—the sale amount for which the gas station must phone the center and obtain authorization before accepting the customer's card. However, an estimate of raising the floor limit by \$10 predicted that "bad card" losses would double.

Since the company had over 17,000 outlets, the cost of installing a sufficient number of terminals and support communications lines to handle the expected increase in calls was prohibitive.

Periphonics installed the voice response credit card authorization system shown in Fig. 2 for the oil company in the fall of 1981. Within 60 days the system was handling 400,000 calls a month—a 25% increase—but with a staff of just 11 operators (down from the previous 44). The cost per call dropped by 60% and the bad-card acceptance rate had also fallen. In fact, operating cost savings paid for the system in less than six months.

There are two interesting aspects to the story. First, one of the supposed drawbacks of voice response technology is its dependence on tone-generating telephones. The oil company gave its dealers two options: either install tone-generating phones or purchase low-cost adapters. After one month, all but a handful of outlets were on the system. The second aspect illustrates how dramatic industry acceptance becomes when a system is effectively designed and implemented. Since the first installation, Periphonics has installed similar systems for six of the seven major oil companies in the U.S.

Voice Response in Order Entry

For most companies, order processing is a time-consuming, expensive operation. Customers must fill out forms and mail them. Upon receipt, the envelopes must be

opened, checked, and key-punched into the order entry system. In addition to the costs and possible errors involved, the company always works with old data in calculating inventory and cash flow in that it is always making assumptions about orders in the mail based on past experience.

One solution to the problem is a telephone order-taking system in which operators sit at computer terminals and take orders over the phone. This approach eliminates the uncertainty about what is in the mail but it imposes extensive costs similar to those of the credit card authorization centers.

A better solution is voice response technology. Using different access codes for customers, sales people, and managers, voice response systems automatically accept, confirm, change, delete, and report on orders without the expensive terminals and communications lines of authorization centers. The key features of Periphonics' voice response systems—the ability to handle voice and data on one set of lines and the means to alter transaction and message content-are particularly important in order entry applications. For example, companies can give preferred customers terminals for high-volume ordering and change the content of the call and the responses to it when products or prices are altered.

A major U.S. pharmaceutical company, for instance, found that voice response significantly increased order speed while reducing both costs and errors. The key to this success is the quality of the system's voice. Previously, the company used a small system having a very mechanical voice quality. Consequently, it was avoided by sales staff and customers alike. The installation of a high-quality voice plus the other features of voice response technology made the difference. The new system now handles a large percentage of the company's orders without order forms or the assistance of operators.

Interestingly, the new system also changed ordering patterns. For example, the company began to receive orders during the middle of the night. The reason was that hospitals transferred the supply and ordering tasks from their overloaded day pharmacists to their night pharmacists. Not only was the day-shift workload eased, but orders often arrived at the pharmaceutical company one day earlier.

Voice Response Ranges Far and Wide

Voice response technology has found its way into a wide variety of business and non-business applications. In the government area, people in Clark County, Nev., report for jury duty by calling a voice response system, rather than sitting in a juror's waiting room. This scheme saves money for the county and is less annoying to jurors.

Several retail-store chains use voice response to report store performance, getting the information to management faster and more accurately Major automobile manufacturers use such systems to validate the status of warranties and vehicle recalls.

Several airlines have found voice response an effective tool for taking reservations from their best customers and for locating lost baggage. Cable TV operators are turning to voice response to take orders for programming changes from subscribers and to offer advertisers efficient telephone ordertaking service.

Bankers around the country find voice response a logical alternative and enhancement to automatic teller machine networks. It gives consumers access to account information and provides the ability to transfer funds and make inquiries without visiting a branch. Some banks have opened systems to the public for receiving automatic interest-rate quotations. In Ecuador, the Banco del Pacifico uses the technology to provide a wide range of in-office and bank-at-home services. One service is a direct computer link to the SWIFT international banking network, which permits a person in Ecuador to sit in his home and, using the bank's voice response system. trade shares on European exchanges.

The keys to these successes stem from the technology's cost-effectiveness and its ability to respond in a clear, understandable, humanlike voice. Of course, voice response technology cannot exist alone, nor is it the complete solution to all problems. But it enhances and works with other data-entry equipment to provide a full set of data communications alternatives to the business community.

FOR FURTHER INFORMATION

Contact Dr. S. Thomas Emerson, President, Periphonics Corporation, 4000 Veterans Memorial Highway, Bohemia, NY. 11716; (516) 467-0500.

SPEECH TECHNOLOGY. JAN/FEB. 1983

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63 F.Supp.2d 583

(Cite as: 63 F.Supp.2d 583)

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United States District Court, E.D. Pennsylvania.

Ronald A. KATZ, Technology Licensing, L.P., and MCI Telecommunications
Corporation, Plaintiffs,

AT & T CORPORATION, et al., Defendants.

No. CIV. A. 97-4453.

Aug. 26, 1999.

Owner of patents for interactive voice response system sued telephone company for infringement. The District Court, Lowell A. Reed, Jr., Senior District Judge, construed claim language.

Claims construed.

West Headnotes

314(5) 291k314(5) Most Cited Cases

Construction of patent claims is exclusively within province of court to determine as matter of law.

[2] Patents € 159 291k159 Most Cited Cases

In construing patent claim, court should consider claim language, specification, and, if offered, prosecution history, which are collectively considered intrinsic evidence of meaning of claim terms; under some circumstances, court may also consult evidence extrinsic to patent, such as technical dictionaries or expert testimony as to how those skilled in relevant art under consideration would interpret claims.

[3] Patents 6 161 291k161 Most Cited Cases Absent special and particular definition created by patent applicant, term in patent claim is construed to mean what person of ordinary skill in art at time of invention would have understood term to mean.

157(1) 291k157(1) Most Cited Cases

Unless otherwise compelled, court should give full effect to ordinary meaning of patent claim terms, even if terms are broad.

[5] Patents 162 291k162 Most Cited Cases

[5] Patents 167(1) 291k167(1) Most Cited Cases

[5] Patents 168(2.1) 291k168(2.1) Most Cited Cases

Once court construing patent terms has determined ordinary meaning of the claim term, it must also consider specification and prosecution history to determine if patentee used term in manner inconsistent with its ordinary meaning.

[6] Patents 67(1.1) 291k167(1.1) Most Cited Cases

One may not read limitation into patent claim from written description, but one may look to written description to define term already in claim limitation, for claim must be read in view of specification of which it is part.

[7] Patents \$\infty\$167(1)
291k167(1) Most Cited Cases

While additional limitations may not be imported into patent claim from specification, court may construe limitation specifically recited in claim in light of specification.

181 Patents 6-167(1.1) 291k167(1.1) Most Cited Cases

In order to inject definition into patent claim from written description, claim must explicitly contain term in need of definition.

19 Patents 67(1.1)
291k167(1.1) Most Cited Cases

63 F.Supp.2d 583 (Cite as: 63 F.Supp.2d 583)

Patent claim term should not be narrowed by content of specification unless language of claim invites reference to those sources.

101 Patents 162 291k162 Most Cited Cases

Patent claim term may be given definition other than its ordinary meaning if patentee chooses to be his or her own lexicographer by explicitly setting forth definition in specification, or if terms chosen by patentee so deprive claim of clarity that there is no means by which scope of claim may be ascertained from language used.

111 Patents 168(2.1) 291k168(2.1) Most Cited Cases

Prosecution history cannot enlarge, diminish, or vary limitations in patent claims.

Court construing patent claim may consider prior art cited in prosecution history, which may contain clues as to what claim does not cover.

113] Patents 168(2.1) 291k168(2.1) Most Cited Cases

If patent applicant takes position before Patent and Trademark Office, such that competitor would geasonably believe that applicant had surrendered gelevant subject matter, applicant may be barred from asserting inconsistent position when issued patent is aubsequently construed.

168(2.1) Most Cited Cases

Unless altering claim language to escape examiner rejection, patent applicant only limits claims during prosecution by clearly disavowing claim coverage, that is, by making statement that concedes or disclaims coverage of claims at issue based on piece of prior art.

151 Patents 159 291k159 Most Cited Cases

Extrinsic evidence is to be used for court's understanding of patent, not for purpose of varying or contradicting claim terms.

159 Patents 159 291k159 Most Cited Cases

Extrinsic evidence may be consulted if court is not familiar with terminology of art in which patent is written, but it should not be consulted to clarify ambiguity in claim terms.

171 Patents 159 291k159 Most Cited Cases

Where patent documents are unambiguous, expert testimony regarding meaning of claim is entitled to no weight.

[18] Patents 101(8) 291k101(8) Most Cited Cases

Presumption that use of term "means" in patent claim invokes means plus function limitations may be rebutted if claim recites no function which corresponds, or if claim recites function but also recites sufficient structure or material for performing claimed function. 35 U.S.C.A. § 112.

[19] Patents — 101(8) 291k101(8) Most Cited Cases

Structural term in patent claim need not connote precise physical structure to those of ordinary skill in art in order to avoid means-plus-function analysis, so long as it conveys variety of structures that are referred to by that term. 35 U.S.C.A. § 112.

[20] Patents 226.7 291k226.7 Most Cited Cases

If structure is defined in patent specification in way unrelated to recited function in means-plus-function clause in claim, those additional aspects of structure should not be read as limiting scope of means clause. 35 U.S.C.A. § 112.

In construing means plus function claims, generally a court should not import function of working device or preferred embodiment into claims as part of "means" if such function is not part of function recited in claims. 35 U.S.C.A. § 112.

101(2) Patents © 101(2) 291k101(2) Most Cited Cases

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"Communication facility," called for in patent claims for interactive voice response system, was that part of telephone network that enabled caller to connect to patented system; term did not encompass elements or processes of entire public switched telephone network, or require that system be operated only outside network.

101(2) 291k101(2) Most Cited Cases

"Interface structure" for analysis control system, called for in patent claims for interactive voice response system, referred to hardware and software required to connect processors upon which system was running to communication facility such that information from facility and remote terminals could be provided to and received by system; in context, phrase also included means to perform specific function of providing caller data signals representative of data developed at remote terminals, and means to perform specific function of receiving calling number identification data.

101(8) Most Cited Cases

Critical factor in determining whether term in patent claim limitation which does not invoke "means for" language is subject to means-plus-function analysis despite contrary presumption is whether term brings to mind set of structures to those of ordinary skill in art, and not whether term is written in functional language. 35 U.S.C.A. § 112.

101(2) Patents 101(2) 101(2) 101(2) 101(2) 101(2) 101(2) 101(2) 101(2)

"Means to provide caller data signals" and "means to receive calling number identification data," called for in patent claims for interactive voice response system, were limited to disclosed structures which specifically performed those functions. 35 U.S.C.A. § 112.

101(2) Patents 101(2) 291k101(2) Most Cited Cases

"Voice generator" for analysis control system, called for in patent claims for interactive voice response system, meant device for generating vocal instructions or prompts to individual callers at remote terminals.

[27] Patents 101(2)

291k101(2) Most Cited Cases

"Record structure" for analysis control system, called for in patent claims for interactive voice response system, referred to means for entering or making use of files, but did not delineate or restrict types of functions that could be performed on files once they were accessed.

[28] Patents 101(2) 291k101(2) Most Cited Cases

"Qualification structure" for analysis control system, called for in patent claims for interactive voice response system, was limited to disclosed structures which performed function of controlling access to system by individual callers. 35 U.S.C.A. § 112.

[29] Patents 101(2) 291k101(2) Most Cited Cases

"Means for selecting," called for in patent claims for interactive voice response system, was limited to disclosed structures which specifically performed function of selecting format based on called number. 35 U.S.C.A. § 112.

[30] Patents 101(2) 291k101(2) Most Cited Cases

"Switching structure" for analysis control system, called for in patent claims for interactive voice response system, meant device, including hardware and associated software, that could switch or route telephone calls or signals from one location or connection to another.

[31] Patents 101(2) 291k101(2) Most Cited Cases

"Record testing structure" for analysis control system, called for in patent claims for interactive voice response system, was limited to disclosed structures which specifically performed function of receiving and testing signals against stored data. 35 U.S.C.A. § 112.

[32] Patents (101(2)) 291k101(2) Most Cited Cases

Term "processing," called for in patent claims for interactive voice response system, meant manipulation of data which performed some operation or sequence of operations on data.

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Term "format," called for in patent claims for interactive voice response system, meant computer program that set forth content and sequence of steps to gather information from and convey information to callers through pre-recorded voice prompts and messages.

[34] Patents 101(2) 291k101(2) Most Cited Cases

"Multiple formats" or "plurality of formats," called for in patent claims for interactive voice response system, meant more than one format; terms did not include subroutines or branching within single format.

[35] Patents 101(2) 291k101(2) Most Cited Cases

"Remote terminals," called for in patent claims for interactive voice response system, meant devices or instruments for connecting callers to telephone network for voice and digital communication, including, but not limited to, conventional telephones.

"DNIS" and "called number identification data," called for in patent claims for interactive voice response system, were synonymous, and meant signal or data that identified number called.

[37] Patents 101(2) 291k101(2) Most Cited Cases

"ANI" and "calling number identification data," called for in patent claims for interactive voice response system, were synonymous, and meant signal that identified calling number, i.e., number from which call originated.

[38] Patents \$\insert 101(2)\$ 291k101(2) Most Cited Cases

"In-band" or "out-of-band" signaling, called for in patent claims for interactive voice response system, did not require or exclude any particular manner of transmission or type of signaling.

[39] Patents \$\inspec 101(2)\$

291k101(2) Most Cited Cases

"Consumable participation key," called for in patent claims for interactive voice response system, meant number or word that allowed caller access to service or part of service predefined limited number of times and which could not be refreshed or recharged.

101(2) Patents 101(2) 291k101(2) Most Cited Cases

"Limit on use," called for in patent claims for interactive voice response system, meant control that limited caller's access to service based on some predetermined method of measuring level of use; term was not restricted to specific method of measuring use, such as limited number of accesses into system.

[41] Patents 101(2) 291k101(2) Most Cited Cases

"Products carrying participation numbers," called for in patent claims for interactive voice response system, meant physical items sold or exchanged in commercial setting which carried number allowing participation in system.

[42] Patents € 101(2) 291k101(2) Most Cited Cases

"Accounting data," called for in patent claims for interactive voice response system, meant information relating to computation of data.

[43] Patents 101(2) 291k101(2) Most Cited Cases

"Operations of an interface," referred to in patent claims for interactive voice response system, meant processes, activities, or functions of interactive connection between processors upon which system was running, communication facility, and callers; phrase did not require that system be running one of the formats disclosed in the specifications.

101(2) 291k101(2) Most Cited Cases

"Answer data," called for in patent claims for interactive voice response system, meant responses from callers to vocal questions or prompts.

[45] Patents 101(2) 291k101(2) Most Cited Cases

"Testing the selected format," called for in patent claims for interactive voice response system, meant method by which it was determined whether any conditions associated with format that had been selected by call data signals were satisfied.

101(11) Most Cited Cases

Where plain meaning of method claim language indicates sequential nature to claim steps and specification does not suggest otherwise, steps must be performed in order written in claim.

[47] Patents 101(11) 291k101(11) Most Cited Cases

Basic steps listed in method claims of patents for interactive voice response system, i.e., receiving call data signals, selecting format, testing selected format, and conditionally interfacing, had to be performed sequentially; additional steps listed in claims, however, did not have to be performed in any particular order.

101(2) 101(2) Most Cited Cases

"Call data signals," called for in testing step of patent claims for interactive voice response system, referred to number from which call originated.

[49] Patents 101(2) 291k101(2) Most Cited Cases

"Conditionally interfacing," referred to in patent claims for interactive voice response system, meant connecting call to selected format once any conditions associated with that format had been satisfied.

[50] Patents 101(2) 291k101(2) Most Cited Cases

"Live Operator Attended Terminals," called for in patent claims for interactive voice response system, did not require that prompts displayed at operating stations be identical to vocal prompts used in automated formats.

[51] Patents 101(2) 291k101(2) Most Cited Cases

"Selecting a processing format" step, referred to in

patent claims for interactive voice response system, was controlled solely by called number.

<u>[52]</u> Patents € 101(2) 291k101(2) Most Cited Cases

"Demographic conditions," referred to in patent claim for interactive voice response system, meant conditions used to limit call based on caller's geographic area.

[53] Patents 101(2) 291k101(2) Most Cited Cases

"Means for directly forwarding," called for in patent claim for interactive voice response system, was limited to disclosed structures which specifically performed function of directly forwarding call from remote terminal to live operator-attended terminal when remote terminal from which caller was calling was not technically capable of digitally providing data. 35 U.S.C.A. § 112.

[54] Patents 101(2) 291k101(2) Most Cited Cases

"First response unit means," called for in patent claims for interactive voice response system, referred to audio response units.

101(2) Patents 101(2) 291k101(2) Most Cited Cases

"Qualification means," called for in patent claim for interactive voice response system, was limited to disclosed structures which specifically performed function preliminarily qualifying callers from remote terminals for connection to interface processors, and software required to perform said qualifying. 35 U.S.C.A. § 112.

101(2) Most Cited Cases

"Second response unit means for receiving calls in a second call mode," called for in patent claim for interactive voice response system, meant call mode, such as 900 call mode or area code mode, other than 800 call mode.

165(4) Most Cited Cases

Whether preamble imposes additional limitation on patent claim depends on whether it is structural or

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mere statement of purpose or use of invention.

[58] Patents 101(2) 291k101(2) Most Cited Cases

"Means for processing calls in an interface format," called for in patent claim for interactive voice response system, was limited to disclosed structures which specifically performed that function. 35 U.S.C.A. § 112.

101(2) Patents 101(2) 291k101(2) Most Cited Cases

"Memory means for storing caller cues and use indications," called for in patent claim for interactive voice response system, meant computer hardware that stored questions or prompts which were given to caller.

101(2) Most Cited Cases

"Means for selecting a current caller cue," called for in patent claim for interactive voice response system, was limited to disclosed structures and associated software which specifically performed function of selecting current caller cue from memory under control of identification signals and use indications.

Patents 328(2) 291k328(2) Most Cited Cases

4,930,150, 5,128,984, 5,255,309, 5,351,285, 5,561,707, 5,684,863. Cited.

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CONCLUSIONS OF LAW REGARDING PATENT CLAIM CONSTRUCTION

LOWELL A. REED, Jr., Senior District Judge.

Ronald A. Katz ("Katz") is the inventor in a large body of patents dealing with telephonic interactive voice applications. The plaintiffs, Ronald A. Katz Technology Licencing, L.P. and Telecommunications Corporation, filed this patent infringement suit against AT & T Corporation, AT & T Universal Card Services Corporation, and AT & T American Transtech, Inc., alleging that the defendants are infringing a number of Katz's patents. In total, over 400 patent claims are at issue in this lawsuit. Because of the complexity and size of the case, the Court ordered that the parties designate a set of approximately seventeen claims to be construed at a *Markman* hearing. The plaintiffs designated twenty claims, including Claims 33, 44, 93, 104, 117, and 192 of the 5,561,707 patent (the '707 patent), Claims *589 49, 50, 65, 79, 171, and 190 of the 5,684,863 patent (the '863 patent), Claim 51 of the 5,255,309 patent (the '309 patent), Claim 15 of the 4,930,150 patent (the '150 patent), Claims 17, 20, 24, and 77 of the 5,351,285 patent (the '285 patent), and Claims 4 and 15 of the 5,128,984 patent (the '984 patent).

A <u>Markman</u> hearing was held from through June 4, 1999, in which the parties presented expert testimony and oral argument as to the proper construction of the disputed claim language in the twenty claims at issue. The parties also submitted a series of briefs and proposed claim constructions to the Court, all of which were considered by this Court in making the claim constructions that follow. On each claim term to be construed, the parties have submitted many arguments and have pointed to many portions of the intrinsic and extrinsic record in their briefs, in their proposed claim constructions, and in their oral presentations. While the Court has considered all of the arguments and citations of the parties, I may not reiterate all of them in full for each claim term.

I. THE LAW OF PATENT CLAIM CONSTRUCTION

In general, a patent must describe the scope of the patentee's invention so as to "secure to [the patentee] all to which he is entitled, [and] to apprise the public of what is still open to them." <u>Markman v. Westview Instruments, Inc., 517 U.S. 370, 373, 116 S.Ct. 1384, 134 L.Ed.2d 577 (1996)</u> (internal quotation omitted). This is accomplished through the specification of the patent, which should describe the invention in clear terms so that a person in the art of the patent may make and use the invention, and the claims of the patent, which should "particularly poin[t] out and

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distinctly clai[m] the subject matter which the applicant regards as his invention." 35 U.S.C. § 112.

[1][2] In Markman v. Westview Instruments, Inc., the Supreme Court, affirming the Court of Appeals for the Federal Circuit, held that construction of patent claims is exclusively within the province of the court to determine as a matter of law. 517 U.S. at 372; 116 S.Ct. 1384. To complete the task of claim construction, a court may draw on the canons of construction that can be sifted from the decisions of the Court of Appeals for the Federal Circuit spanning before *Markman* and beyond. In construing the claims of a patent, a court should consider the claim language, the specification, and, if offered, the prosecution history, which are collectively considered intrinsic evidence of the meaning of the claim terms. See <u>Markman v. Westview Instruments</u>, Inc., 52 F.3d 967, 979 (Fed.Cir.1995). As the public record before the Patent and Trademark Office ("PTO") upon which the public is entitled to rely, the intrinsic evidence is the most important source for determining the meaning of claim terms. Vitronics Corporation v. Conceptronic, Inc., 90 F.3d 1576, 1582, 1583 (Fed.Cir.1996). Under some circumstances, a court may also consult evidence extrinsic to the patent, such as technical dictionaries or expert testimony as to how those skilled in the relevant art under consideration would interpret the Claims. <u>Id</u>

A. CLAIM LANGUAGE

patentee is defined by the claims, claim construction begins and ends in all cases with the actual words of the claim." Renishaw PLC v. Marposs Societa' per Azioni, 158 F.3d 1243, 1248 (Fed.Cir.1998). In construing the terms of a claim, "the focus is on the objective test of what one of ordinary skill in the art at the time of the invention would have understood the term to mean." Markman, 52 F.3d at 987. "Absent a special and particular definition created by the patent applicant, terms in a claim are to be given their ordinary and accustomed meaning." Renishaw, 158 F.3d at 1249.

*590 [4] Unless otherwise compelled, a court should give full effect to the ordinary meaning of claim terms, even if the terms are broad. See Johnson Worldwide Associates, Inc. v. Zebco Corporation, 175 F.3d 985, 989 (Fed.Cir.1999). "General descriptive terms will ordinarily by given their full meaning; modifiers will not be added to broad terms standing alone." Id.

[5] The specification, the prosecution history, and in some situations the extrinsic evidence may confirm the ordinary meaning of the claim terms or may provide a special meaning for the claim terms. See Renishaw, 158 F.3d at 1248. Thus, once a court has determined the ordinary meaning of the claim terms, it must also consider the specification and prosecution history to determine if the patentee used any terms in a manner inconsistent with their ordinary meaning. See Vitronics, 90 F.3d at 1582.

B. SPECIFICATION

[6][7][8][9] While terms are generally given their ordinary meaning, "[c]laims must be read in view of the specification, of which they are a part." Markman, 52 F.3d at 979; see also Phonometrics, Inc. v. Northern Telecom Inc., 133 F.3d 1459, 1466 (Fed.Cir.1998)("Although claims are not necessarily restricted in scope to what is shown in a preferred embodiment, neither are the specifics of the preferred embodiment irrelevant to the correct meaning of claim limitations."). The relationship between the claims and the specification is illustrated by the following pair of claim construction canons: "(a) one may not read a limitation into a claim from the written description, but (b) one may look to the written description to define a term already in a claim limitation, for a claim must be read in view of the specification of which it is a part." Renishaw PLC v. Marposs Societa' per Azioni, 158 F.3d 1243, 1248 While additional limitations may (Fed.Cir.1998). not be imported into a claim from the specification, a court may construe a limitation specifically recited in claim in light of the specification. See Phonometrics, Inc. v. Northern Telecom Inc., 133 F.3d 1459, 1466 (Fed.Cir.1998). Thus, in order to inject a definition into a claim from the written description, the claim must explicitly contain a term in need of definition. See Renishaw, 158 F.3d at 1248, 1252 (noting that passages referring to the preferred embodiment cannot be read into the claim without some "hook"). Further, claim terms should not be narrowed by the content of the specification "unless the language of the claims invites reference to those sources." Johnson Worldwide, 175 F.3d 985, 990 (noting that there "must be a textual reference in the actual language of the claim with which to associate a proffered claim construction").

[10] The <u>Johnson Worldwide</u> court noted two specific situations in which a claim term may be given a definition other than its ordinary meaning: (1) if a patentee chooses to be his or her own lexicographer by explicitly setting forth the definition for a claim term, or (2) if "the terms chosen by the

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patentee so deprive the claim of clarity that there is no means by which the scope of the claim may be ascertained from the language used." 175 F.3d at 990. In these situations, reference should be made to the specifications to determine the meaning of the claims.

Because a patentee is free to be his own lexicographer, the specifications may serve as dictionary for certain terms in the claims. Markman, 52 F.3d at 979-80. However, in order for a patentee to assign a special definition to a claim term, he or she must do so clearly in the specification. Markman, 52 F.3d at 980; see also Renishaw, 158 F.3d at 1249 (noting that a "patentee's lexicography must, of course, appear 'with reasonable clarity, deliberateness, and precision' before it can affect the claim") (quoting In re Paulsen, 30 F.3d 1475, 1480 (Fed.Cir.1994)). "Without an express intent to impart a novel meaning to claim terms, an inventor's claim terms *591 take on their ordinary meaning." York Products, Inc. v. Central Tractor Farm & Family <u> Center, 99 F.3d 1568, 1572 (Fed.Cir.1996);</u> see also <u>Vitronics, 90 F.3d at 1582</u> ("Although words in a claim are generally given their ordinary and customary meaning, a patentee may choose to be his own lexicographer and use terms in a manner other than their ordinary meaning, as long as the special definition of the term in a definition of the term is clearly stated in the patent specification or file history."). Thus, if a term is used in a variety of ways by the patentee in the specification, this may be indicative of the breadth of the term, rather than a limited definition. Johnson Worldwide, 175 F.3d 985, 990-91 (distinguishing Laitram Corp. v. Morehouse Industries, Inc., 143 F.3d 1456, 1463 (Fed.Cir.1998) on the ground that in that case a narrow interpretation was compelled because of unambiguous language in the specification made clear that the claim language had only one interpretation).

As for the second situation discussed in <u>Johnson Worldwide</u>, while a court generally construes claim terms consistent with their common meaning, a "common meaning, such as one expressed in a relevant dictionary, that flies in the face of the patent disclosure is undeserving of fealty." <u>Renishaw</u>, 158 F.3d at 1250. Also, a court may also resort to the specifications if a claim term lends itself to several common meanings; in such a situation "the patent disclosure serves to point away from the improper meanings and toward the proper meaning." *Renishaw*, 158 F.3d at 1250.

C. PROSECUTION HISTORY

[11][12] The third source of intrinsic evidence that a court may consider in understanding the meaning of the claims is the prosecution history. However, "[a]lthough the prosecution history can and should be used to understand the language used in the claims, it too cannot 'enlarge, diminish, or vary' the limitations in the claims." Markman, 52 F.3d at 980 (quoting Goodyear Dental Vulcanite Co. v. Davis, 102 U.S. 222, 227, 12 Otto 222, 26 L.Ed. 149 (1880)). A court also may consider the prior art cited in the prosecution history, which may contain clues as to what the claims do not cover. See Vitronics, 90 F.3d at 1583.

[13][14] If a patentee takes a position before the PTO, such that a "competitor would reasonably believe that the applicant had surrendered the relevant subject matter," the patentee may be barred from asserting an inconsistent position on claim construction: Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448, 1457 (Fed.Cir.1998); see also Cole v. Kimberly-Clark Corporation, 102 F.3d 524, 531 (Fed.Cir.1996) (holding that the patentee was estopped from arguing that her "perforation means" encompassed "ultrasonic bonded seams" after she distinguished references that contained such seams). If a patentee distinguishes a reference on multiple grounds to the PTO, any one of these may indicate the correct construction of a term. See Gentry Gallery, Inc. v. Berkline Corporation, 134 F.3d 1473, However, "[u]nless 1477 n. * (Fed.Cir.1998). altering claim language to escape an examiner rejection, a patent applicant only limits claims during prosecution by clearly disavowing claim coverage," that is, by making a statement that concedes or disclaims coverage of the claims at issue based on a piece of prior art. York Products, 99 F.3d at 1575.

D. EXTRINSIC EVIDENCE

[15][16][17] A court may, in its discretion, consider extrinsic evidence in order to correctly understand and define the language of the claims. See Markman, 52 F.3d at 980. However, "[e]xtrinsic evidence is to be used for the court's understanding of the patent, not for the purpose of varying or contradicting the terms of the claims." Markman, 52 F.3d at 981; see also Vitronics, 90 F.3d at 1584. Extrinsic evidence may be consulted if the court is not familiar with the terminology of art in which the patent is written, but it should not be *592 consulted to clarify ambiguity in claim terms. See Markman, 52 F.3d at 986. "Indeed where the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled to no weight." Vitronics, 90 F.3d at 1584.

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E. MEANS PLUS FUNCTION LIMITATIONS

Paragraph 6 of section 112 of 35 U.S.C. provides that:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

This provision of the patent statute permits a patentee to write a limitation in a combination claim as a means for performing a function without reciting structure, material, or acts in the limitation. See Valmont Industries, Inc. v. Reinke Mfg. Co., Inc., 983 F.2d 1039, 1042 (Fed.Cir.1993). A patentee who invokes this drafting tool is required, however, to describe in the patent specification some structure which performs the specified function. See Valmont, 983 F.2d at 1042.

[18] If a patentee uses the word "means" in a claim, a presumption arises that he or she used the word to invoke § 112, ¶ 6. See <u>Rodime PLC v. Seagate</u> Technology, Inc., 174 F.3d 1294, 1302 (Fed.Cir.1999). There are two ways this presumption may be rebutted: (1) if a claim term uses the word "means" but recites no function which corresponds, or (2) if the claim recites a function but also recites sufficient structure or material for performing the claimed function. See Rodime, 174 F.3d 1294, 1302. It is also possible that a claim limitation that does not recite the word "means" may be construed under § 112, ¶ 6, despite a presumption See Cole v. Kimberly-Clark to the contrary. Corporation, 102 F.3d 524, 531 (Fed.Cir.1996) (citing Raytheon Co. v. Roper Corporation, 724 F.2d 951, 957 (Fed.Cir.1983)).

[19] Even if a mechanism is defined in functional terms, such as a "filter," "brake", "clamp," or "detent mechanism," or if it does not call to mind a single well-defined structure, it may not be subject to means-plus- function analysis. See Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583 (Fed.Cir.1996) (noting that "[d]ictionary definitions make clear that the noun 'detent' denotes a type of device with a generally understood meaning in the mechanical arts, even though the definitions are expressed in functional terms" and that "[i]t is true that the term 'detent' does not call to mind a single well-defined structure, but the same could be said of other commonplace structural terms such as "clamp"

or "container" "). In addition, a structural term need not connote a precise physical structure to those of ordinary skill in the art to avoid a means-plusfunction analysis, as long as it conveys a variety of structures that are referred to by that term. Personalized Media Communications, LLC v. International Trade Commission, 161 F.3d 696, 704-705 (Fed.Cir.1998) (noting that "detector" was not a generic structural term such as "means," "element," or "device" nor a coined term such as "widget" or "ram-a-fram" in deciding that use of the term "digital detector" did not subject the limitation to § 112, ¶ 6 analysis). The critical inquiry is "not simply that a [mechanism] is defined in terms of what it does, but that the term, as the name for structure, has a reasonably well understood meaning in the art." Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583 (Fed.Cir.1996).

Once the court has determined that a claim limitation is written in means plus function form, the court must define what the "means" are in the claim. The first step is to determine the function that the *593 See Rodime, 174 F.3d claimed means performs. 1294, 1302. The claim language must link the term "means" to a function or the limitation is not subject See York Products, Inc. v. Central to 112, ¶ 6. Tractor Farm & Family Center, 99 F.3d 1568, 1574 (Fed.Cir.1996). Next, the court must determine what structure, material, or acts disclosed in specification correspond to the word "means." Chiuminatta Concrete Concepts, Inc. v. Cardinal Industries, Inc., 145 F.3d 1303, 1308 (Fed.Cir.1998).

[20][21] In determining the structure disclosed in the specification that corresponds to the means, the court should be wary of importing excess limitations from For example, if a structure is the specification. defined in the specification in a way unrelated to the recited function in the means-plus- function clause, those additional aspects of the structure should not be read as limiting the scope of the means clause. See Chiuminatta, 145 F.3d at 1308-1309 (construing a patent for an apparatus and method for cutting concrete, the court held that because the function that corresponded to the means in the limitation was supporting the surface of the concrete, structural aspects of the skid plate in the preferred embodiment that did not perform this particular function were not to be read as limiting the scope of the means clause). In addition, in construing means plus function claims, generally a court should not import a function of a working device or a preferred embodiment into the claims as part of the "means" if such a function is not part of the function recited in the claims. Rodime, 174 F.3d 1294, 1305; see also Constant v. 63 F.Supp.2d 583 (Cite as: 63 F.Supp.2d 583)

Advanced Micro-Devices, Inc., 848 F.2d 1560, 1571 (Fed.Cir.1988) ("Although the specification may aid the court in interpreting the meaning of disputed language in the claims, particular embodiments and examples appearing in the specification will not generally be read into the claims.").

II. CONSTRUCTION OF THE TWENTY CLAIMS PRESENTED AT THE MARKMAN HEARING

The twenty patent claims presented to the Court for construction at the <u>Markman</u> hearing may be categorized into the following groups: (1) Analysis Control System Claims, including Claim 51 of the '309 patent, Claims 33, 104, 117 and 192 of the '707 patent, and Claims 49, 50, 65, and 171 of the '863 patent, (2) Claims Involving Products Carrying Participation Numbers, including Claims 44 and 93 of the '707 patent and Claims 79 and 190 of the '863 patent, (3) Conditional Format Claims, including Claim 15 of the '150 patent and Claims 17, 20, 24, 77 of the '285 patent, and (4) Claims from the '984 patent, including Claims 4 and 15.

A. ANALYSIS CONTROL SYSTEM CLAIMS

The first set of claims, the Analysis Control System Claims, come from the '707, '863, and '309 patents. The text and figures of the specifications to these three patents are identical, so references to the specification in one patent are equally applicable to analysis of a term appearing in a claim in another of the three patents. The text of the analysis control system claims at issue is provided in the Appendix to the Memorandum.

In general, the '707, '863, and '309 patents describe a system which interfaces callers at remote terminals through a telephone network to provide voice prompts to the callers so that they can provide information to the system. The information from the callers may be stored in the system for processing. The content of the prompts provided by the system to the callers and the type of processing performed on the information provided by the callers is determined by a format, designed to implement, for example, an auction sale or a contest.

1. "Communication Facility"

[22] The parties have asked the Court to construe the term "communication facility." *594 [FN1] The plaintiffs argue that although the term does not have a common meaning to one of ordinary skill in the art, [FN2] the meaning is clear from the claim language.

The plaintiffs contend that because the purpose of the communication facility in the claims is to connect callers to the interactive voice application ("the Katz system"), the kind of communication facility is inconsequential and the Court should construe the term to mean "any telephone network that enables callers to make calls." (Pls.' Brief at 44-45).

FN1. The parties agree that the term "telephonic [or 'telephone'] communication system" is synonymous with "communication facility" and thus should be construed the same. The Court finds no reason in the claim language, specifications, or prosecution history of the patents which contain these terms to construe the two terms differently.

In addition to Claim 51 of the '309, the term "communication facility" or "telephonic [or 'telephone'] communication system" appears in the following claims: Claims 33, 44, 93, 104, 117 and 192 of the '707 patent, Claims 49, 50, 65, 79, 171, and 190 of the '863 patent, Claim 10 of the '309 patent, Claims 17, 20, 24, and 77 of the '285 patent, and Claim 15 of the '984 patent. There being no indication to the contrary, the Court concludes that these terms have one meaning across all the patent claims at issue in the *Markman* hearing.

FN2. Both Mr. Morganstein, the expert for the plaintiffs, and Professor Larky, one of the experts for the defendants, testified that a person of ordinary skill in the art of interactive voice response systems would have had at least a Bachelor's degree in a scientific or engineering field, such as physics, electrical engineering, or computer science, and at least two years experience working in the field of computer telephony. (Transcript volume 1 at 77-78; volume 3 at 39).

The defendants attack this proposed construction of communication facility and argue that the Court should construe the term as requiring that (1) the communication facility comprise the entire Public Switched Telephone Network ("PSTN") [FN3] and (2) the Katz system must be operated only outside the PSTN or communication facility. To support their argument that the communication facility comprises the entire PSTN, the defendants point to particular

language in the specifications that they contend supports such a construction. First, the defendants point to Column 3 of the '707 patent at line 13, which provides that "[i]n the disclosed embodiment, the remote terminals T1 through Tn represent the multitude of conventional telephone terminals that are coupled to a communication facility C which may take the form of a comprehensive public telephone system for interconnecting any associated terminals T1-Tn." Because the specification indicates that the communication facility has the ability to connect any associated terminals (such as telephones), the defendants argue that the communication facility must include the entire PSTN. Similarly, the defendants argue that Katz defined communication facility as the entire PSTN in line 63 of Column 4 of the '707 patent, which provides that "DNIS capability is a function of the communication facility C (composite telephone system)." The defendants maintain that these passages of the specification indicate that the communication facility should be construed to mean the entire PSTN.

FN3. Professor Larky defined the PSTN as the comprehensive public telephone system which "includes the operations of the various local exchange carriers (such as Bell Atlantic), and interexchange (long distance) carriers, such as AT & T and MCI." (Expert Report of Larky at 14). Although, the Court did not need to draw on expert testimony to construe the meaning of the term "communication facility," reference to the expert's report to understand the meaning of the term PSTN is essential to understanding the defendants' argument.

The plaintiffs argue that the passages relied on by the defendants do not support their construction and that the specification indicates a contrary definition. of "communication facility." In Column 17 of the '707 patent, Katz states that callers to his system could be billed through the "pay-to-dial network." The plaintiffs argue that this indicates that "communication facility" may comprise any part of the *595 PSTN, including the pay-to-dial network, that allows calls to be made by a caller to the Katz system and does not require that it comprise the entire PSTN. In addition, the plaintiffs contend that the prosecution history supports this construction. In a Preliminary Amendment dated January 10, 1986 in the prosecution of the '299 patent, Katz amended his claims to replace the term "public communication facility" with the term "communication facility."

(Ex. 26). Katz also added a claim during the prosecution of the '299 patent, claim 15, which provided: "A system according to claim 1 wherein said communication system comprises a public communication system." (Ex. 26). By altering his claims, the plaintiffs argue, Katz clearly did not limit his claims to always require use of the entire PSTN.

This Court concludes that the claim language does not shed much light on the scope of the communication facility; however, there is no indication from claim language itself that the communication facility must include the entire The specification is more helpful in determining the scope of the term at issue. Column 3, lines 55-59 of the '707 patent, Katz states that "[i]n the illustrative embodiment of the system, the communication facility C comprises a public telephone network." This indicates that the communication facility may, but is not required to involve the entire PSTN. In addition, the prosecution history of '299 patent cited by the plaintiffs, in which Katz removed the word "public" from modifying "communication facility," is consistent with this indication. The references to the specification made by the defendants do not undermine this reading of the claim language and specification and do not lend support to the defendants' proposed construction of this term. Thus, I conclude that in light of the claim language, specifications, and prosecution history presented by the plaintiffs, the term "communication facility" does not require the involvement of the entire PSTN or thus, all of its elements and processes.

To support their argument that "communication facility" is defined in the patents such that the Katz system must be operated only outside the PSTN or communication facility, the defendants point to the language of the preamble and claim limitations. The parties agree that because the terms "communication facility" and "analysis control system," which initially appear in the preamble, are referred to in the claim limitations, these terms should be considered as limitations in the claims. See Gerber Garment Technology, Inc. v. Lectra Systems, Inc., 916 F.2d 683, 689 (Fed.Cir.1990). The preamble provides for "[a]n analysis control system for use with a communication facility;" the defendants contend that this language, particularly the word "with," indicates that the Katz system, the analysis control system, is necessarily outside of the network. Further, the defendants argue that because the preamble indicates that the communication facility provides call data signals to the Katz system, this indicates that Katz was not referring to the internal routing signals that

occur inside the telephone network.

Turning to the language of the claim limitations, the defendants point out that Katz used the phrase "coupled to said communication facility," which they argue indicates that the Katz system is something distinct from the communication facility because it is "coupled to" it. The defendants also contend that the limitation "interface structure coupled to said communication facility ... including means to provide signals representative of data developed by said remote terminals and for receiving said calling number identification data and said called number identification data (DNIS) to identify one from a plurality of called numbers" indicates that the interface structure cannot be a switch inside the PSTN, because switches send *596 DNIS, not receive it. [FN4] This, the defendants argue, is further proof that the Katz system cannot include any elements or processes which are inside the PSTN.

FN4. This limitation is not present in Claim 51 of the '309 patent, but it and similar limitations appear in other claims in which the term "communication facility" is used. See, e.g., Claim 171 of the '863 patent (dependent on Claim 93 of the '863).

In addition, the defendants refer the Court to Figure 1 in the specification. First, the defendants argue that the Katz system is represented as a "dead-end" or the place at which a call terminates, not as a mechanism by which calls are connected from one person to another, as is the function of the PSTN. Second, the defendants argue that pursuant to the Code of Federal Regulations, if an aspect of the invention is represented in the figure as a rectangular box, it indicates that that aspect is not essential to the understanding of the invention, citing 37 C.F.R. § 1.83(a). Thus, the defendants argue, the fact that the communication facility is represented in the figure as an empty box lends support to their position that the Katz system must be operated only outside the network.

Finally, the defendants point to the specification of the '707 patent at Column 6 at line 14, which provides that "individual callers would use the remote terminals T1-Tn to contact the central station D through the communication facility," as indicating that by using the word "through," Katz indicated that the Katz system must be operated only outside the PSTN.

The plaintiffs argue that the claim language is silent as to whether the Katz system must function only "inside" or "outside" the network. Further, the plaintiffs argue that there is nothing in the specification that requires that the Katz system function only outside the network. The plaintiffs maintain that although the communication facility is represented in Figure 1 as an empty box, certain parts that the defendants would consider to be "inside" the PSTN, such as the remote terminals and customer. billing, are split out and shown as separate boxes in Figure 1. Thus, the plaintiffs contend that if customer billing and the remote terminals can be shown as separate empty boxes and still be "inside" the PSTN, there is no basis in Figure 1 for construing the Katz system, which is also represented by separate boxes, as "outside" the PSTN.

The Court concludes that there is no basis in the claim language, the specifications, or in Figure 1 to construe the term "communication facility" to mean that the Katz system must be operated only outside the communication facility. It appears that the essence of the defendants' argument here is that the Katz system cannot run on any of the equipment that is part of the communication facility, and thus, is "outside" of the communication facility. The Court is not persuaded that the words "for use with," "through" or "coupled to" indicates that the Katz system must be operated only outside the communication facility. The words "with," "through," and "coupled to" connote some type of relationship between two things; however, none of these terms means that the two things in the relationship cannot be considered part of the same system or entity."

Finally, the defendants argue that, claim language and specification aside, Katz clearly limited his invention to a system only existing outside the communication facility in his representations to the PTO during the prosecution of his patents. defendants point to comments by Katz during the prosecution of the '707 patent regarding patents to DeBruvn. Riskin, Comella, and Daudelin. Specifically, the defendants point out that in an Amendment dated August 31, 1995, Katz stated that he amended his claim to recite "that processing of at least certain of the data developed by the terminals and the calling number identification data occurs in the Applicant's system" and that "[n]either DeBruyn nor Riskin teach this aspect of the Applicant's system, also neither patent *597 teaches calling number identification data provided automatically by a communication system (for example, ANI or like signals)." (Ex. 51).

In addition, the defendants point out that in the same Amendment, Katz noted in part that Comella's system "replaces the function of an operator for certain types of calls, for example, collect calls, person-to-person calls, charge-to- third number calls and so on" and that the patent to Comella "is somewhat of background interest for its interface aspects." (Ex. 51). As for the patent to Daudelin, the defendants point out that Katz described it as "generally directed to an interface arrangement for reducing the load on telephone operators." (Ex. 51). Apparently, the defendants contend that if Katz had contemplated that his system could have operated inside the PSTN, he should have said a lot more than he did to adequately distinguish his invention from the Daudelin and Comella patents, which were inventions that were operated by the PSTN.

Whether Katz complied with his obligations before the PTO, however, is a question for another day; the question before the Court is whether Katz made any statements to the PTO that limited the scope of his claims. Considering the passages of prosecution history flagged by the defendants, the answer to that question is no: The Court concludes that the statements by Katz regarding these patents do not constitute a representation from him to the PTO that his invention could be operated only "outside" the communication facility.

Further, the defendants point to statements made by Katz to the PTO in the September 19, 1994 Supplemental Information Disclosure Statement ("IDS") during the prosecution of the '575 patent, which occurred while the application of the '707 patent was still being prosecuted. Specifically, the defendants point to a passage in which Katz referred to a patent by DeBruyn and stated in part that the patent to DeBruyn "discloses a lottery system that is integral with the 'Telephone Company,' " and that in Katz' system, "the 'Telephone Company' communication facility') simply provides interface, the lottery system being a separate and distinct capability." (Ex. 41). However, taking the statements highlighted by the defendants in context, Katz points out differences between his system and the DeBruyn system including that in Katz system the caller must enter "lottery and identification data," while in the DeBruyn system, the caller need not enter such information because the system is run inside the "Telephone Company" where the callers' telephone number is already known. statements highlight that the Katz system requires that a caller enter certain data, which is not required by the DeBruyn system; the statements do not limit

the physical or geographic location where the Katz system can or cannot operate.

Similarly, the defendants refer to another piece of prosecution history in which Katz discussed a patent to DeBruyn for a telephonic lottery system. (Ex. 46). In the September 30, 1994 IDS in the prosecution of the '120 patent, [FN5] Katz stated that DeBruyn was distinct from his system which received identification from a caller because the it was "integrated with the composite telephone system which could identify the subscriber's telephone number." The Court concludes that the statements of Katz in the September 19, 1994 Supplemental IDS and the September 30, 1994 IDS do not restrict or limit the term "communication facility" to mean that the Katz system must be operated only outside of it.

FN5. The '120 patent is related to the patents-in-suit; the defendants cite to this prosecution history because the claims at issue contain language regarding the communication facility which is similar to the patents before the Court. (Defs.' Brief at 34 n. 20).

The defendants argue that Katz also distinguishes his system from the routing and connection of telephone calls, which *598 are integral functions of a telephone company, thereby establishing that his system was to operate only outside the network. The defendants point to a statement made by Katz regarding a patent to Riskin in the prosecution of the '075 patent. (Ex. 40). In the Preliminary Amendment dated July 17, 1990, Katz stated that "[r]ecognizing that the Riskin patent discloses the utilization of ANI and DNIS signals to accomplish telephone routing, it is respectfully submitted that applicant's system different involves entirely philosophical considerations and structure." The defendants contend that because the Riskin patent was a system that was inside the telephone network, this statement by Katz indicates that his system was to be operated outside the PSTN. Similarly, the defendants argue that Katz distinguished his invention during the prosecution of the '929 patent [FN6] from a patent to Riskin by stating that his invention was outside the PSTN. (Ex. 37). In the Amendment dated August 1, 1990, Katz noted that in the Riskin patent, "functions are involved that are completely distinct from applicant's system.... Specifically, Riskin does not disclose an interface telephone system but rather discloses a connection system." concludes that in these statements, however, Katz is

discussing functional differences between the Riskin system and his system, not differences in the physical or geographic location of the elements of the systems.

<u>FN6.</u> The '929 patent is a direct descendant of the '299 Application, from which all the patents-in-suit descend.

Essentially, the defendants are attempting in their arguments regarding "communication facility" to put a non-infringement rabbit in their hat at the claim construction stage of the case; in their arguments, they expressly seek to include any and all of their equipment, wires, switches, computers, trunks, lines, databases, and so on in the definition of "communication facility" and then establish that the Katz system cannot by definition include any of those things or run on any of that equipment because his system must be "outside" the communication facility. The result of adopting such reasoning would be to restrict the definition of "communication facility" on the basis of who owned the computer or switch on which the Katz system was running or on the basis of the physical or geographic location of the particular computer or switch. The plain words of the patents will not support such a restricted definition.

Based on the foregoing inspection of the claim language, specification, and prosecution history, the Court construes the term "communication facility" in the Katz patents to mean: that part of a telephone enetwork that enables a caller to connect to the Katz system. The Court concludes that there is no support for a construction of "communication facility" to require that the Katz system be operated only outside the entire PSTN nor that the "communication facility" encompass the elements or processes of the entire PSTN.

2. Application of Means-Plus-Function Analysis

The analysis control system claims contain several limitations that contain a "structure" or "means" term, such as "interface structure," "voice generator structure," and "means to provide call data signals representative of data developed by said remote terminals." While the parties agree that some of these terms are subject to means-plus-function analysis under 35 U.S.C. § 112, ¶ 6, the plaintiffs dispute the application of such analysis to other terms.

a. "Interface Structure"

[23] The first of these terms the parties wish the Court to construe is "interface structure." [FN7] The claim limitations in *599 which this term appears read "an interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication." In some of the claims, the limitation goes on to provide that the interface structure includes "means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals." [FN8] Other claims contain limitations which further provide that the interface structure includes means "for receiving said calling number identification data." [FN9]

FN7. The term "interface structure" appears in the following claims under consideration at the <u>Markman</u> hearing: Claim 51 of the 309 patent, Claims 33, 104, 117 and 192 of the 707 patent, and Claims 49, 50, 65, and 171 of the 863 patent.

FN8. Claims which include this or similar language are Claims 51 of the '309 patent, Claims 104 and 117 of the '707 patent, and Claims 49, 65, and 171 of the '863 patent.

<u>FN9.</u> Claims which include this or similar language are Claims 104, 117, and 192 of the '707 patent and Claims 49, 65, and 171 of the '863 patent.

The dispute between the plaintiffs and the defendants centers around whether structure" is subject to means-plus-function analysis under 35 U.S.C. § 112, ¶ 6. The plaintiffs maintain that the term does not implicate § 112, ¶ 6 and should be construed to mean "a hardware device with associated software that establishes an interactive. connection between a caller's telephone and a computer system." (Pls.' Brief at 50). The plaintiffs argue that under <u>Personalized</u> LLCCommunications, v. International Trade Commission, 161 F.3d 696, 704-705 (Fed.Cir.1998), a term that is defined in terms of its function or that does not bring to mind one well-defined structure is not necessarily subject to means-plus-function In Personalized Media, the Court of Appeals for the Federal Circuit held that the term "digital detector" was not subject to means-plusfunction analysis because it conveyed to one of ordinary skill in the art "a variety of structures known

as detectors." <u>Id. at 705.</u> The plaintiffs argue that the term "interface structure" is akin to "digital detector" in that it is a sufficient recitation of structure so as to avoid the application of meansplus-function analysis. The plaintiffs argue that a specific set of structures corresponding to "interface structure" was known to those of ordinary skill in the art at the time of the prosecution of the Katz patents.

The defendants argue that the term "interface structure" is written in functional language, fails to sufficiently connote structure to those of ordinary skill in the art, and as such, it subject to analysis under \S 112, \P 6. The defendants contend that Katz simply used the term "structure" instead of "means" to attempt to avoid the application of \S 112 \P 6. The defendants maintain that "interface structure" is a generic term which does not inform a person of ordinary skill in the art what structure is being conveyed by the term.

[24] Because the term "interface structure" is not drafted in "means for" form, the Court presumes that it is not subject to the requirements of § 112 ¶ 6. See Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 1213 (Fed.Cir.1998). The critical factor in determining whether a term in a limitation which does not invoke "means for" language is subject to I means-plusanalysis function despite presumption to the contrary is whether the term brings to mind a set of structures to those of ordinary skill in the art, and not whether the term is written in functional language. See <u>Personalized Media</u>, 161 F.3d at 704-705. To determine whether this term would connote sufficient structure to those of ordinary skill in the art, this Court must refer to references in the computer telephone field contemporary with the prosecution of the Katz patents. See Greenberg, 91 F.3d at 1583 (consulting dictionaries to determine that the term "detent" denoted a device generally understood to those in the mechanical arts).

*600 In an article in the AT & T Technical Journal regarding the Conversant 1 Voice System, [FN10] "trunk interface units" are described as connecting incoming trunks from a central office in the telephone network, and "line interface units" are described as initiating or receiving calls over ordinary telephone lines. (Ex. 366). In an 1985 article entitled "The AT & T Multi- Mode Voice SystemsFull Spectrum Solutions for Speech Processing Applications," the authors refer to "telephone interface units (either line or trunk circuits)" as being a component of a basic system for speech processing applications using the telephone

network and centralized databases. (Ex. 358). Other references in the record indicate that "interface structure" connoted structure to those of ordinary skill in the art: Exhibit 355, an article regarding Periphonics Voicepac, describes a particular brand of device used as an interface; Exhibit 405, a 1986 article on the Conversant 1 Voice System, discusses the function of line and trunk interfaces; Exhibit 250, the 4,866,756 patent to Crane et al., incorporates a "telephone interface component" to transmit audio response signals; and Exhibit 235, the 4,797,911 patent to Szlam et al., incorporates "trunk interface units" into its customer account online servicing system.

<u>FN10.</u> The date of this article is unclear in the record, but there is some indication in the article that the manuscript was revised in 1986.

One technical dictionary cited by the plaintiffs was helpful in assisting the Court determine what "interface structure" meant to those in the art. In the Dictionary of Computing and New Information Technology by A.J. Meadows, et al. (1982), the term "interface" is defined as being "[u]sed as a general term to describe the connecting link between the two systems. Most frequently refers to the hardware and software required to couple together two processing elements in a computer system." (Ex. 481).

While the testimony of the experts at the Markman hearing is not as weighty as prior art and technical references in determining the state of the art at the time of the prosecution of the Katz patents, it is consistent with the above references in indicating that "interface structure" had meaning and brought to mind a set of structures to those in the field. See Morganstein Testimony, Transcript Volume 1 at 173, line 24 to 176, line 2 (testifying that the term "interface structure" would have had meaning to a person of ordinary skill in the art who had read the Katz patents and would have brought to mind a range of structures such a person could have used to build the Katz inventions); Larky Testimony, Transcript Volume 3 at 64 lines 12-15 (testifying that he recognized that the term "interface structure" referred to "some physical structure" but not a specific structure).

Based on the above references and expert testimony, the Court concludes that although the term "interface structure" is written in functional language, the limitation sufficiently connotes structure such that §

112, ¶ 6 does not apply. That is, I conclude that, based on the cited prior art, references, and testimony of the experts at the <u>Markman</u> hearing, the term "interface structure" would have called to mind a specific set of structures to a person of ordinary skill in the art such that such a person would be able to build the Katz inventions.

Having concluded that the term "interface structure" is not subject to § 112, ¶ 6, the Court must construe the meaning of the term according to the regular rules for claim construction. The meaning of "interface structure" to those of ordinary skill in the art at the time has been discussed above. In addition, in Column 4, line 52 to Column 5 line 15 of the '707 patent, Katz discusses the function and components of the interface structure and states that "the interface 20 incorporates modems, tone decoders, switching mechanisms, DNIS and ANI capability (call data analyzer 20a) *601 along with voice interface capability" and that the "interface 20 provides the connection of the first lines to a switch 21 which are in turn coupled to first function units, or processors PRI to PRn." This description of the interface in the specification is consistent with the ordinary meaning of the term "interface structure" to those of skill in the art. Based on the foregoing, I construe the term interface structure" in the Katz patents to mean "the hardware and software required to connect the processors upon which the Katz system is running to the communication facility such that information from the communication facility and the remote terminals may be provided to and received by the "Katz system." For the claims listed in footnote 8, supra, the Court construes the term "interface structure" to also include the means to perform the specific function of providing caller data signals representative of data developed at the remote terminals. For the claims listed in footnote 9, supra, the Court construes the term "interface structure" to also include the means to perform the specific function of receiving calling number identification data.

b. "Means to Provide Caller Data Signals" and "Means to Receive Calling Number Identification Data"

[25] Some of the limitations beginning with the term "interface structure" contain terms drafted in "means for" language, including "means to provide caller data signals" in Claims 51 of the '309 patent, Claims 104 and 117 of the '707 patent, and Claims 49, 65, and 171 of the '863 patent, and means "to receive calling number identification data" in Claims 104, 117, and 192 of the '707 patent and Claims 49, 65,

and 171 of the '863 patent. [FN11] Both sides agree that these terms are subject to means-plus- function analysis. The plaintiffs argue that the structure that corresponds to the "means" in "means to provide caller data signals" is the Interface 20 in Figure 1 or Interface 1A sub1 through 1A subN and 1B sub1 through 1B subN in Figure 9 of the '309, '707, and '863 patents. The plaintiffs argue that the structures in Figure 1 that correspond to the "means" in "means to receive calling number identification data" are the Interface (20) and the Call Data Analyzer (20a). The defendants argue that the "means" in both of these means- plus-function limitations corresponds to the structures referenced by the plaintiffs but also corresponds to the Automatic Call Distributor ("ACD").

FN11. Some of the claims contain slight variations on this language, but the Court concludes the meaning of the various phasing of this concept is the same.

The Court concludes that the phrases "means to provide caller data signals" and "means for receiving said caller number identification data" are written in "means for" form, do not recite sufficient structure in the claim language, and are subject to analysis under § 112, ¶ 6. According to the specification of the '707 patent at Column 4, lines 28-31, the ACD functions to "queue incoming calls for connection to a lesser number of lines." The ACD does not fulfill and is not necessary to the function of providing call or receiving calling number signals identification data and thus does not correspond to The Court the "means" in those limitations. concludes that the structure disclosed in the patents that corresponds to the "means" in the "means to provide caller data signals" is the Interface 20. The Court concludes that the structures disclosed in the patents that correspond to the "means" in "means for receiving calling number identification data" are the Interface 20 and the Call Data Analyzer 20a. .

c. "Voice Generator Structure"

[26] The term "voice generator" appears in several of the analysis control system claims at issue, and the limitations containing this term read "voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions *602 to said individual callers." [FN12] The parties agree that the term "voice generator structure" is not subject to meansplus-function analysis because the term connotes a

specific range of structures that correspond to the term to those of ordinary skill in the art. The Court concludes that the plain meaning of the term "voice generator" indicates a structure that can produce vocal sounds. The specification of the patents in which this term is found describes the voice generator structure as "a voice origination apparatus prompt individual callers who (after qualification) provide select digital data to develop a record for further processing." Column 2 lines 4 to 8 of the '707 patent. The specification also provides that the voice generator is incorporated in the interface, Column 4, lines 55 to 58 of the '707 patent, and that "recorded voice messages prompt callers to provide data by actuating the alphanumeric buttons" on their telephones, Column 1, lines 45 to 47 of the '707 patent. Based on the term's ordinary meaning, the claim language, and the specification, the Court concludes that "voice generator" means: a device for generating vocal instructions or prompts to individual callers at the remote terminals.

FN12. The term "voice generator structure" is found in Claim 51 of '309, Claims 33, 104, 117, and 192 of the '707 patent, and Claims 65 and 171 of the '863 patent. In Claim 192 of the '707 patent, the limitation provides that the voice generator structure is also able "to prompt said individual callers to enter data."

d. "Record Structure"

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[27] The term "record structure" begins limitations in many of the Analysis Control System Claims at issue; the limitation in Claim 51 of the '309 patent reads "record structure, including memory and control means, connected to receive said caller data signals from said interface structure for updating a file and storing digital caller data relating to said individual callers provided from said digital input means through said interface structure." [FN13]

FN13. The term "record structure" appears in the following claims: Claim 51 of the '309 patent, Claims 33, 104, 117, and 192 of the '707 patent, and Claims 49, 50, 65, and 171 of the '863 patent. The wording of the record structure limitations varies across these claims; however, all include "memory and control means" and the concept of receiving information about callers from the interface structure or the communication

facility and then storing, updating, accessing, or testing that information. Thus, the definition of the term "record structure" will be the same across the claims at issue in which it appears.

The plaintiffs argue that "record structure" is not subject to means-plus- function analysis because the term connotes structure to those of ordinary skill in Morganstein testified at the Markman hearing that a person of ordinary skill in the art who had read the Katz patents would have understood "record structure" to refer to a set of structures; Morganstein testified that the record structure would correspond to one of the building blocks of interactive voice applications, including processors, memory, and software. (Transcript volume 1 at 181-182). Larky did not disagree with Morganstein and testified that "record structure" would have connoted structure to those in the field. (Transcript volume 3 at 67-68). The plaintiffs also argue that the phrases "including memory" [FN14] and "connected to receive said caller data signals from said interface structure" are additional structural descriptions of record structure in the claims which support their position that the term does not implicate § 112, ¶ 6. The plaintiffs' proposed construction of this term is "a hardware device with associated *603 software, including memory and control means, used to store information." (Pls.' Appendix at 132).

FN14. It appears that both sides agree that the term "memory" does not implicate § 112, ¶ 6. Morganstein testified at the Markman hearing that a person of ordinary skill in the art would have been aware of many kinds of "memory," such as RAM, tapes, cassettes, and disks. See Morganstein Testimony, Transcript volume 1 at 106. Thus, the Court construes the term "memory" according to its plain meaning as: computer hardware that stores information, such as disks, RAM, or tapes.

The defendants argue that "record structure" is subject to § 112, ¶ 6 because the term is defined by the function it performs--accessing a file and storing data--and because it lacks a sufficiently definite structure to those of ordinary skill in the art. The structures that correspond to this term, the defendants argue, are the Processing Unit 92, Memory 98 with storage cells C1 through Cn in Figure 4, and the required wiring to connect these structures together.

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The defendants argue that "record structure" also corresponds to the required software for performing the disclosed functions. The defendants contend that the only software programs disclosed in the specifications are in the context of the specific "formats" described by Katz, such as game shows,

lotteries, and auctions. [FN15]

FN15. The defendants argued as well on other claim terms that the structures corresponding to the means in mean-plusfunction limitations included software that was particularly programmed to carry out one of the seven formats disclosed in the specifications or to perform "statistical analysis to isolate a subset." In support of this argument, the defendants submitted the recent case of WMS Gaming Inc. v. International Game Technology, 184 F.3d 1339 (Fed.Cir.1999) after the close of the Markman hearing. Upon full consideration of the WMS Gaming case and the letters submitted to the Court by the parties regarding this issue, the Court concludes that the new decision by the Federal Circuit does not require that the software corresponding to the means in these limitations be specifically programmed to perform one of the seven formats disclosed in the specifications or statistical analysis to isolate a subset of callers or data.

Based on contemporary technical dictionaries and the testimony of the experts, the Court concludes that the term "record structure" is not subject to § 112, ¶ 6 because the term would have connoted sufficient structure to those of ordinary skill in the art. The Court construes the term "record structure" to mean: computer hardware and software required to receive data signals, update files, and store information.

The limitations containing the term "record structure" provide that the record structure includes memory and "control means ... for accessing a file." The parties agree that "control means" is subject to § 112 ¶ 6. The plaintiffs point to the Processing Unit 92 and Memory 98, including cells C1 through Cn in Figure 4 or Processors PR1 through PRn in Figure 1 as the structures that correspond to "control means." The plaintiffs contend that an alternative structure for control means disclosed in the patents is a microcomputer or microprocessor, such as the Central Processing Unit 251 in Figure 9, programmed to perform the disclosed functions.

The defendants agree that the term "control means" corresponds with the structures the plaintiffs have identified, but the defendants contend that the term also must include the associated wiring and software.

The first step in means-plus-function analysis is to identify the function performed by the means; here, the function of the "control means" is to receive calling number identification data, to access a file, and to store data relating to certain of said individuals callers. The Court concludes that the patent discloses that the control means correspond to the Processing Unit 92 and Memory 98, including the cells, C1 through Cn in Figure 4 and the Processors. PR1 through PRn in Figure 1. See Column 16, lines 24-28, and 44-46 of the '707 patent and Column 18, lines 21-25 of the '707 patent. In addition, "control means" corresponds to the software that enables these structures to perform the functions of receiving and storing data and accessing files. The Court concludes that the control means also correspond to a microprocessor, such as the Central Processing Unit 251 in Figure 9, programmed to perform the disclosed functions, as such a structure can also perform the disclosed *604 functions of the control means. See Column 5, lines 12-33, Column 9, lines 59 to 67, and Column 21, lines 9-20 of the '707 patent. .

The core dispute between the parties in relation to the record structure limitations is over the meaning of the term "accessing." The plaintiffs argue that the term "accessing" includes anything a computer can do to a file, such as creating or opening records or storing additional information entered by callers. The defendants argue that the term "accessing" does not encompass deleting a file or creating or initiating a file because a file must exist before it can be "accessed." The defendants point to passages of the specification in which the ideas of updating a file are distinct from creating a cell in memory in the first instance. See Column 12, line 63-65, Column 16, lines 29-32, and Column 17, lines 29-30 of the '707 patent. Thus, they contend that the term "accessing" must mean retrieving a file that already exists.

In Claim 51 of the '309 patent, Katz recites a "record structure, including memory and control means, ... for updating a file." This indicates to the Court that the use of the word "accessing" in a similar limitation in another claim connotes a different meaning. Further, although Katz describes updating files and assigning cells in memory as different functions in the specification, there is nothing in the specification that indicates that the term "accessing" could not

encompass both of those functions.

Webster's Dictionary defines the verb "access" as "to get at, gain access to." Addenda to Webster's 3rd New International Dictionary at 55a (1986). As a noun, the term is defined as "permission, liberty, or ability to enter, approach, communicate with, or pass to and from" or "freedom or ability to obtain or make use of." The Court concludes that the term "accessing" means in the context of the Katz patents: gaining or obtaining the ability to enter or make use of files. The Court further concludes that the term "accessing" in the context of the Katz patents does not delineate or restrict the types of functions that may be performed on the files once they are accessed, such as updating files, creating new files, or deleting files.

e. "Qualification Structure"

[28] "Qualification structure" appears in many of the Analysis Control System Claims, and the limitations in which this term appears vary from claim to claim.

[FN16] Claims 104 and 117 of the '707 patent and Claim 171 of the '863 patent include the broadest limitation including the term, providing for a "qualification structure controlled by said record structure for controlling access to said system by said individual callers." The other limitations containing this term vary on how and on what basis access to the system is controlled.

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FN16. The term "qualification structure" appears in Claim 51 of the '309 patent, Claims 33, 104, and 117 of the '707 patent, and Claims 49, 50, 65, and 171 of the '863 patent.

The plaintiffs argue that this term is not subject to means-plus-function analysis because the term "qualification structure" was well known to those of ordinary skill in the art of building interactive voice applications. The plaintiffs contend that "qualification structure" would have brought to mind a computer processor and its software programs to those of skill in the art.

The defendants argue that this term is subject to means-plus-function analysis because it is written in functional terms and has no meaning to those of ordinary skill in the art without more information than is provided in the claim language. The defendants argue that the term does not escape application of § 112, ¶ 6 because it calls to mind a

computer processor and its programs, as plaintiffs contend. The defendants argue that the structure in Figure 4 that corresponds to this term is the Qualification Unit 93, the Processing Unit 92, the Memory 98, and the software required to qualify callers. See Column 6, *605 line 56 to Column 7, lines 36 and Column 16, lines 19-31 of the '707 patent. The defendants contend that the only software that is disclosed in the patents is in the context of the specific formats discussed by Katz, such as game shows, lotteries, and auctions.

The Court concludes that although the term "qualification structure" does not include the term "means," it is subject to § 112, ¶ 6. "Qualification structure" is written in functional terms and the Court is not convinced that it would not have brought to mind sufficient structure to a person of ordinary skill in the art without further reference to the specification. The function performed by the "qualification structure" is controlling access to the Katz system by individual callers. The structures disclosed in the specification that perform this function are the Qualification Unit 93 and the Processor 92 in Figure 4. [FN17]

FN17: For the term "qualification structure" in Claim 33 of the '707 patent, which provides for "[a]n analysis control system according to claim 26, wherein said limit on use restricts relates to a dollar amount," the defendants claim that the corresponding structures are the Qualification Unit (93) and Look-up Table (99) or Use Rate Calculator (100) in Figure 4, as well as the software required to perform the function of testing the data from callers to specify a basis for entitlement to assess to the Katz system. See Column 17, lines 38-62 of the '707 patent. The Court concludes that these structures designated by the defendants correspond to the qualification structure in Claim 33 of the '707 patent.

The qualification structure limitations raise additional construction issues. In Claims 49 and 50 of the '863, the qualification structure controls access to the Katz system "based on at least two forms of distinct identification including caller customer number data and at least one other distinct identification data element consisting of personal identification data." The parties agree that a "caller customer number" is a number that is assigned to a merchant's own customer; however, the defendants

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contend that the caller customer number cannot be a credit card number because it is not assigned from a vendor to a customer. The defendants point to Column 11, lines 6-7 of the '863 patent, which describes the customer number in a mail order format as the number found on the customer's catalog. Thus, the defendants argue the customer number cannot be a credit card or charge number because such a number does not identify the caller as a customer of the merchant. In Column 11, lines 19-22 of the '863 patent, Katz states that a caller's customer number may be stored along with his credit card number and expiration date; the defendants argue that this indicates that a customer number and a credit card number are two separate items.

The defendants also argue that the second piece of identification data cannot be a personal identification number (PIN) or an expiration date from a credit card because such numbers are not unique to the individual, or "personal," without the corresponding credit card number or calling card number. The defendants point out that in Column 11, lines 1-5 and 19-22 of the '863 patent, Katz describes "other distinct identification data" in the mail order format as both a credit card number and its expiration date.

Along with the specification, the defendants point to the prosecution history of the '707 patent as support For their construction of "caller customer number data" and "other distinct identification data." In the May 8, 1995 Office Action during the prosecution of the '707 patent, the examiner rejected pending Claim 33, which provided for a "record structure with means for recording an identification card number and at least one other distinct identification data element," as unpatentable over the '554 patent to Asmuth. The examiner noted that Asmuth contained the "record structure" of Katz's claim and taught "that input 'caller data signals' may include a telephone credit card number (in the claim 'identification card number') ... and a 'distinct identification data element' consisting of 'personal identification data' (in the patent *606 a 'PIN')." Katz subsequently amended what was then Claim 33 to recite a qualification structure in a form similar to the claims at issue. See August 31, 1995 Amendment. In his comments to that amendment, Katz stated that he added a "qualification structure" requiring two forms of distinct identification including a caller's customer number to qualify a caller, and that the addition of the qualification structure and the fact that Asmuth stored data to define the virtual private network while his invention stored data developed by the callers rendered the Katz invention distinct.

As for the term "caller customer number data," the claim language does not support the narrow construction proposed by the defendants. That is, there is no support in the claims for the notion that this form of identification could not be a credit card or other charge number if such a number identified the caller as a customer of a particular merchant or vendor. The mention in the specification of storing the customer number as distinct from the credit card number was given as an example; similarly, the example of the customer number located on a customer's catalog was not provided as a requirement for a customer number.

The second term, "distinct identification data element consisting of personal identification data," is not subject to the narrow construction proposed by defendants either. The word "distinct" indicates that this second form of identification must be different than the first form of identification for each caller. The claim language also requires that this second piece of information contain something "personal" by way of identification, that is, data that is assigned to a person or identifies a person as an individual as opposed to a customer of a merchant or vendor. Nothing in the claim language instructs that this second piece of identification cannot be a personal identification number (PIN) or an expiration data from a credit card as long as the data identifies the The prosecution history cited by the individual. defendants does not require that the Court adopt the defendants' construction either; Katz did not state in the Amendment that his system would not accept a PIN as a form of personal identification.

Thus, based on the claim language, the Court construes "caller customer number data" to mean: a number assigned to a customer by a vendor or merchant or recognized by a vendor or merchant for the purpose of identification of the customer. The Court construes "other distinct identification data element consisting of personal identification data" to mean: data that identifies a caller as an individual which is distinct from customer number data.

f. "Means for Selecting"

[29] The parties agree that the term "means for selecting" is subject to means-plus-function analysis. This term appears in Claim 104 of the '707 patent, in dependant Claim 103. The function, which is set out in the claim language itself and described in Column 10, lines 34 through 43 of the '707 patent, that is performed by the "means" is selecting a specific one of a plurality of formats based on the called number.

the '707 patent discloses that the "interface 20 incorporates ... DNIS ... capability (call data analyzer 20a)." As explained in line 62 of the same column through line 2 of Column 5, "DNIS" is a function of the communication facility which provides data indicating the called number and may be used with the interface 20 and call data analyzer 20a.

The defendants contend that the Automatic Call Distributor AC1, the Interface 20, and the Switch 21 correspond to the "means" in "means for selecting." However, the specification at Column 6, lines 37 through 48 indicates that the ACD merely receives the call signal from the caller and "associates" the called number through the interface and the switch to the specific processor that contains the particular format associated with called number. Similarly, in Column 10, lines 31-43, the specification *607 discloses that the communication facility couples the caller at the remote terminal to the correct processor to run the format selected by the called number through the ACD, the interface, and the switch. These passages do not specify which of these structures is performing the specific function of reselecting the format based on the called number, as opposed to connecting the caller to the correct processor once the format has been selected.

The portion of the specification cited above from Columns 4 and 5 more clearly identifies that the interface and the CDA are the structures which perform the disclosed function. Thus, the Court concludes that the disclosed structure that incorresponds to the "means" in "means for selection" is the Interface 20 and the Call Data Analyzer 20a in Figure 1. The ACD and the switch do not correspond to the means.

g. "Switching Structure"

[30] The term "switching structure" appears in Claims 49 and 50 of the '863 patent, and in context reads "switching structure coupled to said interface structure for switching certain select ones of said individual callers at said remote terminals to any one of a plurality of live operators wherein said live operators can enter at least a portion of said caller data relating to said select ones of said individual callers through interface terminals, which is stored in said record structure."

The plaintiffs contend that this term is not subject to means-plus-function analysis because the term "switch" is well known to those experienced in computer telephony and it brings to mind structure to those of skill in the art. The plaintiffs argue that

switching structure should be defined as "hardware with associated software used to route calls." (Pls.' Appendix at 164).

The defendants contend that the term "switching structure" is subject to analysis under § 112, ¶ 6 because the term lacks a sufficiently definite structure such that one of skill in the art would not know what structure to build without more information than is provided in the claim. The defendants argue that in the passages that discuss the switching structure, including Column 5, lines 51-55; Column 7, lines 13-17; Column 10, lines 45-52; and Column 11, lines 8-12 of the '863 patent, Katz did not disclose structure to perform the entire function performed by the means, which is switching callers to a live operator, where the live operator enters caller data for storage in the record structure.

During the Markman hearing, all of the experts referred to "switches" in their discussion of computer telephony at the time of the Katz patents. Similarly, the term "switch" was often used in contemporary references and prior art referred to by the parties at . The Court concludes that, based on the hearing. these examples of the state of the art and the testimony of the experts, the term "switching structure" does not implicate § 112, ¶ 6. The Court concludes that the term would have connoted a specific set of structures to those of ordinary skill in the art. Thus, based on the claim language and the specification, the Court construes the term "switching structure" to mean: a device including hardware and associated software that can switch or route telephone calls or signals from one location or connection to another.

h. "Record Testing Structure"

[31] The term "record testing structure" appears in Claim 192 of the '707 patent. The limitation in full provides for a "record testing structure connected to receive and test said caller data signals including said calling number identification data and said caller personal identification data against previously stored calling number identification and caller personal identification data."

The plaintiffs argue that this term is not subject to means-plus-function analysis because it would have called to mind sufficient structure to those of ordinary skill in the art. The plaintiffs propose that the Court construe "record testing structure" to mean "a hardware device, with associated*608 software, used to store information and implement tests based on that information." (Pls.' App. at 155).

The defendants argue that "record testing structure" is subject to § 112, ¶ 6. The structures the defendants contend corresponds to the function performed by the record testing structure are the Processing Unit 96, the Qualification Unit 93, the Buffer Storage 97, either the Look-up Table 99 or the Use Rate Calculator 100, and the logic within the qualification unit to receive information regarding the calling number from the interface. Further, the defendants argue that the structure corresponding to "record testing structure" cannot be any computer with any type of memory; if this were the case, the defendants argue, § 112, ¶ 6 would have no The defendants contend that the meaning. processing unit must be programmed to receive decoded personal identification data from the callers and to test it against stored data for the callers.

The Court concludes that "record testing structure" implicates \S 112, \P 6 because "record testing" is clearly a functional term and it does not connote any structure for performing the function of receiving and testing said caller data signals including said calling number identification data and said caller personal dentification data against previously stored calling personal identification and caller Inumber The Court concludes that the identification data. structures disclosed in the specification that correspond to "record testing structure" are the Processing Unit 96, the Qualification Unit 93, and the Look-Up Table 99 in Figure 4. See Column 10, lines 1 through 25 of the '707 patent. Contrary to the defendants' contentions, the described functions of the Use Rate Calculator 100 and the Buffer Storage 97 in Column 10, lines 1 through 25 of the '707 I patent are not required to perform the function of receiving and testing signals against stored data called out in the claim. Thus, these structures do not correspond to record testing structure.

3. "Processing"

[32] The next term the parties presented to the Court for construction from the Analysis Control System patents is "processing." In Claims 104 and 117 of the '707 patent, the term appears in context as "means for processing at least certain of said data developed by said terminals and said calling number identification data relating to certain select ones of said individual callers." In Claim 192 of the '707 patent, the terms appears in context as "analysis structure for receiving and processing said caller data signals under control of said record testing structure." The final analysis control system claim at issue in which "processing" appears reads "means for

processing at least certain of said data developed by said remote terminals relating to certain select ones of said individual callers." Claim 171 of the '863 patent.

The parties agree and the Court concludes that the phrase "means for processing" is a means-plus-function limitation subject to § 112, ¶ 6. The structures corresponding to the "means" in "means for processing" include the Processing Unit 92 in Figure 4, the Central Processing Unit 251 in Figure 9, or the Processors PR1 through PRn in Figure 1.

The defendants argue that the term "analysis structure" in "analysis structure for ... processing" is also subject to means-plus-function analysis. support their position, the defendants contend that in the '739 patent, which shares the same specification as the '707, '863, and the '309 patents, Katz used the term "analysis means" in limitations similar to the limitations which contain "analysis structure." The plaintiffs contend that "analysis structure" had meaning to those in the art and connoted computer hardware and software used to analyze data, such as a processor. (Pls' App at 160-61). The Court concludes that the term analysis structure is written in functional language and does not connote sufficient structure to avoid the application *609 of § 112, ¶ 6, despite the presumption to the contrary. function of the analysis structure in the terms of the claim language is "receiving and processing said caller data signals under control of said record testing The structures that correspond to "analysis structure" are the same as those that correspond to the "means" in "means for processing," i.e., the Processing Unit 92 in Figure 4, the Central Processing Unit 251 in Figure 9, or the Processors PR1 through PRn in Figure 1.

The core dispute between the plaintiffs and defendants is whether "processing," as used in "means for processing" or otherwise in the patents, requires a specific type of processing. defendants contend, in the context of their meansplus-function arguments, that the structures that correspond to the "means" in "means for processing" also include the software that performs the function of processing, and because the only type of processing disclosed in the specification is statistical analysis to isolate a subset of callers in the context of the specific formats disclosed, the computer must be programmed with software that performs this particular kind of processing. Specifically, the defendants argue that all of the disclosed formats in the specification, including a health poll format, mail order format, instant lottery format, auction sale

format, television game show formats, and television poll format, require the use of statistical analysis to isolate a subset; thus, they argue, "processing" and "statistical analysis" are synonymous. The defendants also argue that if the term "processing" is given a broad, unlimited meaning, it would render other limitations that call out specific functions of a computer surplusage, such as "accessing" a file, "storing" data, and "testing" data.

The plaintiffs argue that the defendants' proposed construction of "processing" has no support in the claim language, and that the defendants are attempting to define the function of "processing" by importing structural limitations from the specifications. The plaintiffs argue that the term should be given its ordinary meaning, which is "performing some operation or sequence of operations on data and/or telephone calls." (Pls.' Appendix at 7).

The term "processing," even as part of the phrase "means for processing," is not subject to means-plus-function analysis, so an immediate resort to the specification for meaning is not appropriate unless there is some "hook" in the claim language on which limitations from the specification may be hung. See Renishaw, 158 F.3d at 1252. Thus, if the term "processing" in the context of the claim language had a common, ordinary meaning to those of ordinary skill in the art, that meaning is the proper construction of the term, even if it is broad. See Johnson, 175 F.3d 985, 989.

IJ. Contemporary technical dictionaries indicate to the Court that "processing" had a broad meaning to those of skill in the art for some time. In the context of these claims it is clearly implied that the processing is being performed on data. The Standard Dictionary of Computers and Information Processing by Martin H. Weik (1969) defines the verb "process" as follows: "In data processing, to handle, manipulate, or perform some operation or sequence of operations on data in accordance with a specified or implied algorithm, usually as a series of discrete steps, including operations such as compute, assemble, compile, interpret, generate, translate, store, retrieve, transfer, select, extract, shift, search, sort, merge, transliterate, read, write, print, erase, and punch. The processing usually results in a solution to a problem." (Ex. 458). In the Computer Dictionary, by Charles J. Sippl (1966), the term "process" is defined as a "generic term that may include compute, assemble, compile, interpret, generate, etc." In the Dictionary of Computing and New Information Technology, by A.J. Meadows et al.

(1984), the term "data processing" is defined as including "all clerical, arithmetical and logical *610 operations on data. Data processing in the context of information technology always implies the use of a computer for these operations." (Ex. 483).

The claim language also shows that the term "processing" does not by itself indicate statistical analysis to isolate a subset of callers. Many claims, dependent and independent; in the '707, '863, and '309 patents specifically call out processing to isolate a subset of callers. For example, Claim 169 of the '707 patent specifically calls out processing to isolate a subset of callers. Claim 174 of the '863 provides for "subsequent" processing that isolates a subset of callers; however, Claim 171, upon which Claim 174 depends, does not require such a parameter on the initial processing. Similarly, Claim 181 of the '863 provides for "processing ... responsive to said approval signals." Claim 185 of the '863 patent, which is dependant on Clam 181, specifically provides for processing to isolate a subset callers. The fact that "processing" is called out in some claims, and then specifically "processing to isolate a subset of callers" is called out in other claims, some of which are dependant on the claims that call out "processing" generally, indicates that the independent claims which contain the term "processing" do not necessarily require that the processing perform statistical analysis to isolate a subset of callers or data. See Rodime PLC v. Seagate Technology, Inc., 174 F.3d 1294, 1306 (Fed.Cir.1999). "processing" were given the limited scope explicitly called out in the dependent claims, those claims would be rendered superfluous, a result that should be avoided if the claim language will allow under the doctrine of claim differentiation. See Laitram Corp. 939 F.2d 1533, 1538 Rexnord, Inc., (Fed.Cir.1991). [FN18].

FN18. The defendants contend that under Laitram, claim differentiation does not apply to means-plus-function limitations; however, the term "processing" is the functional language of the claim and is not subject to means-plus-function analysis.

There is nothing in the specifications that requires the Court to alter the broad meaning of "processing" conveyed in the claims, even though the subject of statistical analysis to isolate a subset of callers is repeatedly discussed. The name of the patents under consideration is "Telephonic- Interface Statistical Analysis System."

At several points in the

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specification, Katz describes his invention generally. or one of the formats generally as performing statistical analysis to isolate a subset of callers. See Column 1, line 58-67 of the '707 patent (providing that "[i]n general, the present invention comprises a telephonic-interface system and related process ... in a variety of different interface formats or programs, as to ... statistically analyze acquired data, as in combination and is association with external data (time independent), and accordingly to isolate a subset of the callers with variable identification"); Column 2, line 22-26 of the '707 patent (providing that "in accordance with various formats, acquired data is processed in statistical relationship, or in relation to applied external data"); Column 5, lines 53-55 of the '707 patent (providing that "[i]n general, the processing evolves a subset (at least one caller) the members of which may be verified or confirmed"); Column 21, lines 33-38 (providing that, "[i]n view of the above explanation of exemplary systems, it will be appreciated that other embodiments of the present invention may be memployed in many applications to accumulate statistical data, process such data, and define subsets of callers of concern").

It is no surprise that Katz discussed statistical analysis to isolate a subset of callers in the specifications to the '707, '863, and '309 patents because he specifically called out this function in some, but not all, of the claims in those patents. Conversely, there is no mention in the specifications to the '285 and '150 patents of "statistical analysis" or "isolating a subset of callers" because none of the claims in those patents specifically call out such processing, even though the term "processing" *611 appears in the claims of those patents. While the specifications of the '707, '863, and '309 patents call out several embodiments of the Katz invention in which processing is performed to isolate a subset of callers through statistical analysis, not all of the claims that contain the broad term "processing" Whether, as defendants require this limitation. argue, Katz's claims are broader than his disclosure in the specifications of his patents, is a question for another day and does not alter the construction of "processing," a term that clearly had a broad and common meaning to those of ordinary skill in the art.

The portions of the prosecution history highlighted by the defendants do not conflict with the common understanding of "processing." During the prosecution of the '968 patent, from which the patents-in-suit descended, Katz distinguished his invention from a collection of prior art in part on the basis that his invention variously incorporated "(1) personal participant selectivity, (2) participant record development and (3) analytical inter- related data processing with respect to developed records." (Ex. 33, March 2, 1988 Amendment at 14). defendants argue that this statement by Katz indicates that all of his claims, including pending Claim 37 which did not explicitly call out "statistical analysis to isolate a subset," incorporate statistical analysis or "inter-related processing." However, pending Claim 38, which was dependent on Claim 37, added the specific limitation of "processing said statistical data as to isolate a subset of said individual callers." Katz's assertions during the prosecution of the '968 patent that his invention variously incorporated three elements does not require, and this Court will not, import the limitation of "analytical inter-related data processing" or "statistical analysis to isolate a subset" into the definition of "processing" in claims of the '968 patent, or of any of the patents at issue in the Markman hearing.

During the prosecution of the '923 patent, which has the same specification as the '707, '863, and '309 patents, Katz attempted to distinguish his invention from a patent to Riskin by stating that the Riskin patent did not "suggest any interrelated processing between callers, nor are processing files formed other than merely to accommodate billing." (Ex. 38). In an Appeal Brief dated September 11, 1992 during the same prosecution, Katz described his invention as systems that "statistically acquire data, as in combination with and in association with external data (time independent), and accordingly isolate a subset of the callers with verifiable identification." (Ex. 38). Similarly, in the Information Disclosure Statement dated January 31, 1996 at 13 during the prosecution of the '185 patent, Katz informed the PTO that "[i]n various applications, Applicant's inventive systems have utilized an operation of processing data to isolate a subset of callers. In a refined form, the operation involves processing data from callers in combination to isolate a select subset of the callers by 'interrelated' processing." (Ex. 56). These statements by Katz indicated that his patents suggest or include interrelated processing or statistical analysis to isolate a subset of callers, which is clear by the claims which explicitly call out this However, none of these statements by Katz indicates that any particular claim includes this type of processing or that all processing suggested in his patent is of this type.

Based on the foregoing, the Court construes the term "processing" to mean: manipulation of data which performs some operation or sequence of operations on the data.

4. "Format"

[33] The next term presented to the Court for construction is "format." This term appears in many of the claims at issue in the <u>Markman</u> hearing. For example, Claim 104 of the '707 patent provides for "[a] system according to claim *612 103, wherein said called number identifies a specific one of a plurality of operating formats for interface." Claim 192 of the '707 patent provides for "[a]n analysis control system according to claim 191, wherein said select called number (DNIS) identifies a select format from a plurality of distinct operating formats."

The plaintiffs contend that the term "format" as used in the patents had a common meaning to those of ordinary skill in the art, and they ask the Court to define "format" as "a computer program, including instructions and/or pre- recorded messages, for providing a service to callers." (Pls.' Appendix at 7).

The defendants argue that although the term The detendants argue that are some of the grant only explicitly appears in some of the claims, the concept of "format" is implicit in all of the claims and corresponds to the "analysis control system" that is called out in the claims under Arguing that the term is imprecise consideration. and ambiguous without reference to specifications, the defendants contend that "format" is defined by Katz in the specification as analysis that sisolates a subset of callers and should be limited to include only the seven formats disclosed in the specifications, including mail order, auction, health poll, television game show, television game show requiring participation numbers, lottery, and television poll formats. Alternatively, the defendants argue that if the Court does not limit "format" to the seven disclosed embodiments, it should define "format" by common threads present in all the for example, the defendants formats disclosed; contend that a format must include a data acquisition phase in which callers enter or are assigned data for processing, and a processing phase in which that data for multiple callers is statistically analyzed with like data for other callers or with common external data to isolate a subset of callers participating in the format.

Construction begins with the claim language, and the language here is instructive. Considering Claim 192 of the '707 patent, which is quoted above, it is clear that "analysis control system" and "format" are not the same concept, as the claim includes both terms and indicates that the format is only a part of the analysis control system.

The language of other claims which were not designated for the <u>Markman</u> hearing supports a construction of format that does not require statistical analysis and is not limited to the seven disclosed embodiments of the specifications. In some claims, Katz specifically limited the format in a claim to a particular type of format. For example, Claim 42 of the '707 provides for a "promotional format," Claim 45 of the '863 patent provides for an "order format," Claim 46 of the '863 provides for a "television initiated mail order operation," and Claim 56 of the '863 provides for a "merchandising format." The fact that these particular formats are called out in some of the claims indicates that the term "format" alone is not limited to any particular format or set of formats.

The specifications of the patents do not indicate that "format" must include statistical analysis or be limited to the disclosed embodiments. Although the Background and Summary of the Invention in the specifications to the '707, '863, and '309 patents describes the invention as generally performing certain functions, including statistically analyzing data, it does not explicitly require that the "format" Finclude statistical analysis or that the "format" is See Column 1, performing the statistical analysis. lines 43- 47, 57-67 of the '707 patent; Column 2, lines 4-14, 22-26 of the '707 patent. In addition, the language of the Background and Summary of the it provides what the Invention is exemplary; invention is generally or what it may include or perform. See Column 1, lines 43 through 67 of the Similarly, in describing the seven '707 patent. disclosed embodiments of his invention, Katz repeatedly stated that the examples were illustrative or exemplary. See, e.g., Column 9, lines 48 through 51; Column *613 11, lines 66 through 67; Column 12, lines 1 through 19 of the '707 patent.

Figure 3 of the '707, '863, and '309 patents is a flow diagram for one operating format of the Katz system. See Column 2, lines 44-45 of the '707 patent. The diagram illustrates a series of commands or instructions for the computer and the sequencing of those commands, including the content and sequence of voice prompts and the operations on data to be. stored in or retrieved from memory. There is no indication in the figure of statistical analysis or that the format is limited to the disclosed embodiments. To limit the term "format" in these patents to the disclosed embodiments would violate the ruling of Harris Communications, Inc. Corporation, 156 F.3d 1182, 1187 (Fed.Cir.1998) and similar cases.

The prosecution history cited by the defendants does not support their proposed construction of "format." During the prosecution of the '023 patent, the examiner rejected certain of Katz's claims as anticipated by a patent to Riskin because the Riskin patent described various "formats," including stock quotation, movie directory, and product information services. (Ex. 48). Similarly, during the prosecution of the '120 patent, the examiner rejected certain of Katz's claims as being unpatentable over a group of references because the claims contained "game" or "operating process" formats that were selected through the use of the dialed number. statements indicate that the examiner did not consider the Katz formats to be limited to the seven embodiments disclosed in the specifications because the examiner rejected some of Katz's claims as unpatentable over patents which contained "formats" other than the seven described by Katz. defendants pointed to no statements by Katz during the prosecution of the patents in which he disclaimed coverage of any formats other than the formats discussed in the specifications.

Based on the foregoing, the Court construes the term "format" to mean: a computer program that sets forth the content and sequence of steps to gather information from and convey information to callers through pre-recorded voice prompts and messages.

5. "Multiple Formats" or "Plurality of Formats"

[34] The parties also disagree over the proper construction of the terms "plurality of formats" and "multiple format." [FN19] The plaintiffs argue that the terms "plurality" and "multiple" clearly had the common and plain meaning of "more than one" to one of ordinary skill in the art. The defendants do not contest that these terms mean "more than one," but rather they argue that because it is impossible to know whether a system is running on one format or more than one format, "multiple" or a "plurality of" formats must have three characteristics. First, each format must be a separate computer program and not just different questions or branching in the same format. Second, each format must have distinctly different subject matter and functionality. each format must be reached by a different and unique called number.

FN19. These terms appear in the Conditional Format Claims at issue in the '150 and '285 patents and the Participation Number claims at issue in the '707 and '863 patents.

The plaintiffs agree that subroutines or branching within a format do not constitute multiple formats. The specification of the '707 patent confirms this. See Column 18, line 37 (noting in the context of the television game show format that "the basic format can remain the same, only the questions change by time zone"). The plaintiffs also agree that one phone number cannot be used to reach different formats. The specifications support this understanding of "multiple formats" or "plurality of formats." Column 12, lines 5-6 (noting that one of the common structural elements of the Katz invention is "utilizing the called number to select a *614 specific operating format"). However, the patents do not support the defendants' contention that each format of a plurality of formats or multiple formats must be assigned a unique called number.

The patents also do not support the defendants' contention that each format in a plurality of formats or in multiple formats must be different in the function it performs or in subject matter. In the '150 patent specification, Katz states that "[e]xemplary selected formats of the processor might include: public polls, lotteries, auctions, promotions, sales operations and games;" the use of plural to describe the formats indicates that the processor could run more than one of any type of format. Column 2, line 65 to Column 3, line 1 of the '150. Thus, if a processor is running a series of formats, even if all are lotteries or all are mail order formats, this would constitute a "plurality of formats" or "multiple formats."

The prosecution history cited by the defendants does not dictate that the Court should alter the construction of "multiple formats" or "plurality of formats" that is clear from the claim language and specifications. In an Amendment dated January 11, 1990 during the prosecution of the '506 application, Katz amended one of his claims to recite "a plurality of distinctly different operating process formats." (Ex. 36). However, the examiner subsequently rejected this claim as amended, and this particular language does not appear in any of the claims at issue. During the prosecution of the '150 patent, Katz noted in an Amendment dated October 5, 1989 that the patent to Riskin "contains no suggestion of a multiple format processor nor structure for conditioning accepted calls." [FN20] (Ex. 35). The Court concludes that Katz was not limiting the term "multiple format" to require formats with different subject matter or functionality in this statement to the PTO.

FN20. Katz made a similar statement in an Amendment dated June 30, 1992 during the prosecution of the '285 patent. (Ex. 50).

Based on the foregoing, the Court construes the terms "plurality of formats" and "multiple formats" to mean: more than one format. The terms do not include the subroutines or branching within a single format.

6. "Remote Terminals"

[35] The parties dispute the meaning of the term "remote terminals," which appears in claims throughout the body of patents to Katz. The parties agree that the term refers to traditional telephones, but the plaintiffs contend that the term may comprise other devices as well, such as wireless phones or a computer that can access the telephone network.

The plaintiffs contend that a person of ordinary skill in the art reading the Katz patents would understand that "remote terminals" could refer to devices other than traditional telephones. The defendants argue that there is no support in the specifications for any device other than traditional telephones.

The claim language in the patents does not support the defendants limited definition. Claim 96 of the '707 patent is exemplary of many of the claims that contain the term "remote terminals." Claim 96 with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphanumeric buttons for providing data." The use of the words "may comprise" indicates that remote terminals includes, but is not limited to, traditional telephones.

The specification does not limit "remote terminals" to conventional telephones only. In Column 3, line 55 through Column 4, line 18 of the '707 patent, Katz describes *615 the remote terminal illustrated in Figure 1. Although Katz describes what would be considered a traditional or conventional telephone, the specification is clear that the remote terminal in Figure 1 is the illustrative embodiment and that the description of it is exemplary.

The prosecution history cited by the defendants does not restrict the definition of "remote terminals." In

the prosecution history of the '968 patent, in an Amendment dated March 2, 1988, Katz attempted to distinguish his patent from other patents containing, among other devices, "a special form of terminal apparatus at a data source" by noting that "[c]ontrary to the operations of the systems described in the above references, applicant's system interfaces with a conventional telephone instrument." (Ex. 33). Katz went on further to explain regarding "special-purpose instruments" that "[c]learly, telephone telephones could be employed in cooperation with applicant's system; however, a very significant feature of applicant's system is its ability to function cooperatively with a conventional telephone Accordingly, specific forms of instrument. transaction telephone instruments or data phones are not deemed to be particularly applicable to the claims as set forth herein..." Contrary to the defendants' contention, the Court concludes that this statement by Katz indicates that his system could accommodate conventional telephones, as well as other devices, not that it was limited to use with conventional telephones.

Thus, the Court concludes that there is nothing in the claim language, specifications, or prosecution history that indicates that "remote terminals" can only include conventional or traditional telephones and not wireless phones or computers connected to the Based on the foregoing, the telephone network. Court construes "remote terminals" to mean: device or instrument for connecting callers to the telephone network voice ` and for but not limited to, communication, including, conventional telephones.

7. "DNIS" and "called number identification data"

[36] The next terms the Court must construe are "DNIS" and "called number identification data." These terms appear in many of the Analysis Control System claims, including Claim, 104 of the '707 patent which reads "a system according to claim 96 for use with a communication facility having a capability (DNIS) to provide called number identification data to identify a called number from a plurality of different numbers for calling," [FN21] Claim 192 of the '707 patent which reads "an analysis control system according to claim 183, wherein said communication facility automatically provides called number identification data (DNIS) to identify a select called number from a plurality of called numbers," and Claim 65 of the '863 patent which reads "an interface structure ... including means automatically receive call number identification

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signals (DNIS) to identify a select format from a plurality of formats." [FN22]

FN21. This language is found in Claim 103 of the '707 patent, upon which Claim 104 depends.

FN22. The terms "DNIS" and "called number identification data" appear in claims other than the Analysis Control System claims; the parties agree and the Court concludes that the terms have a uniform meaning across all of the claims at issue.

The parties agree that the terms "DNIS" and "called number identification data" have the same meaning and are used interchangeably in the patents. The plaintiffs contend that the terms mean "a signal representative of the number called."

The defendants argue that DNIS or called number identification data must represent the full dialed number, which is seven or ten digits. The defendants also contend that DNIS or called number identification data cannot be internal routing *616 numbers or vector directory numbers; because the claims indicate that the communication facility provides DNIS or called number identification data to the interface and the interface receives DNIS or called number identification data from the DNIS or called number identification data cannot be any signal sent internally in the communication facility.

The Court concludes that the terms "DNIS," "called number identification data," and like terms have the same meaning and are used interchangeably in the patents. The term "DNIS" is an acronym for "dialed number identification service." Both "dialed number service" "caller identification and identification data" contain the word "identification," and the plain import of these phrases is a signal or data that identifies the number that has been called. Thus, the language of the claims does not support the defendants' argument that "DNIS" or "called number identification data" must be the full seven or ten digit dialed number. The claim language does not support the defendants' argument that "DNIS" or "called number identification data" cannot include internal routing numbers within the telephone network; indeed, such numbers are neither mentioned in nor relevant to the Court's construction of the claims at

all.

The passages of the specifications to which the defendants point do not support the limited construction proposed by the defendants either. In Column 12, lines 2 through 6 of the '707 patent, Katz describes one of the structural elements that have reoccurring significance in his inventions as "utilizing the called number to select a specific operating format." The defendants emphasize that Katz lists a ten or seven digit number as an example of the called number in the specifications; in Column 6, lines 41-45 of the '707 patent, Katz explains that "[r]eceiving the call signal, the automatic call distributor AC1 associates the called number ((213) 627-3333, rendered available using standard telephone DNIS techniques) through the interface 20 and the switch 21 to attain connection with the specific processor...." However, the mere reference to "called number" does not restrict "called number identification data" to a certain number of digits, nor is there reason to restrict the terms "DNIS" and "called number identification data" to the examples provided by Katz in the specifications.

Further, in Column 4, lines 62 through 64 of the '707 patent, Katz stated that "[g]enerally, DNIS capability is a function of the communication facility C (composite telephone system) to provide called terminal digital data indicating the called number." "Data indicating the called number" undermines the defendants contention that the data must be the full dialed number. Similarly, in Column 10, lines 39 through 42 of the '707 patent, Katz stated that "[n]ote that the communication facility C provides the dialed number ("(213) 627-4444") to the processing system P1 through well known telephonic equipment DNIS." These passages confirm that DNIS or called number identification data must only be a signal that identifies the called number and need not be only the seven or ten digit number.

The prosecution history cited by the defendants does not alter the meaning of the terms conveyed by the claim language and specifications. The first set of statements by Katz in the prosecution history, the defendants argue, indicates that DNIS or called number identification data must be the full dialed number. In an Information Disclosure Statement dated September 20, 1994 submitted during the prosecution of the '285 patent, Katz attempted to distinguish his claims from a group of patents and other references. (Ex. 50). Katz described the '012 patent to Matthews et al. as a "system identified as Direct Inward Dialing or 'DID,' which involves the capability of utilizing the last three or four digits of a

called number for routing to a desired recipient's telephone" and distinguished *617 the system as "quite different from the combinations set forth in the claims in that, neither DNIS signals were utilized nor were formats selected. Additionally the system was void of either qualification or operator control...." [FN23]

FN23. Katz made an almost identical statement regarding the Matthews patent to the PTO in the prosecution of the '734 patent. (Ex. 61).

Similarly, in a Supplemental Amendment dated March 14, 1995 during the prosecution of the '734 application, Katz also distinguished the '906 patent to Matthews on the basis that the Matthews system "utilizes so called 'DID' signals for accessing an individual program.... However, again, the structure and operation is distinct from Applicant's techniques utilizing DNIS for format selection and further involving testing." (Ex. 61).

whether Katz was basing his distinction on the difference between the number of digits or content of a DID signal versus a DNIS or caller number identification data signal, or if he was basing his distinction on the different functions that those signals performed. What is clear is that Katz did not explicitly state that DNIS or called number identification must include all of the digits of the number dialed.

The second set of statements by Katz in the prosecution history, the defendants argue, indicate athat DNIS or called number identification data cannot be internal routing numbers in the telephone network. In the September 20, 1994 Information Disclosure Statement, Katz described the '682 patent to Vij et al. as "another utilization of 'DID' operation to route Again, the operation is quite distinct from DNIS operation and is further distinguished from the claims herein on the basis of testing, computer interface and so on." [FN24] (Ex. 50). In the same Information Disclosure Statement, Katz described the '500 patent to Binkerd et al. as "another alternative for routing calls utilizing inputs by a caller. Again the system is quite distinct from the utilization of DNIS capability." (Ex. 50). During the prosecution history of the '075 patent in the Preliminary Amendment dated July 17, 1990, Katz stated that "[r]ecognizing that the Riskin patent discloses the utilization of ANI and DNIS signals to accomplish

telephone routing, it is respectfully submitted that applicant's system involves entirely different philosophical considerations and structure. The provision of an interface system utilizing these signals, not only to select an operating format but further to accomplish associative data, is submitted to involve a patentable distinction." (Ex. 40). In an Amendment dated August 31, 1995 during the prosecution of the '707 patent, Katz attempted to distinguish the '336 patent to DeBruyn for an international lottery system on the basis that the system indicated direction or routing to different processors for individual language operation in response to different dialed numbers, but "no suggestion of DNIS appears nor is the system otherwise pertinent." (Ex. 51).

FN24. Katz made an almost identical statement regarding the Vij patent to the PTO in the prosecution of the '734 patent. (Ex. 61).

These statements indicate that Katz distinguished his inventions from other patents on the basis of the comparative functions of the systems; the systems in the other patents use signals to route telephone calls, not select a format from a group of formats or to store data associated with those signals. However, Katz never informed the PTO that the same numbers that other systems used to route calls could not be used to identify the called number and select a format. In short, it is not clear from Katz's statements, contrary to the defendants' contention, that "internal routing numbers," to the extent they can identify the called number, could not be included in the meaning of called number identification data or DNIS, as used in the Katz patents.

*618 Based on the foregoing, the Court concludes that the terms "DNIS" and "called number identification data" are synonymous and mean: a signal or data that identifies the number called.

8. "ANI" and "Calling Number Identification Data"

[37] "ANI" and "calling number identification data" are the next terms presented to the Court for construction. In general, the term "calling number identification data" appears in the claims and the term "ANI" is used in the specifications. The parties agree that "ANI" and "calling number identification data" have the same meaning.

In the Analysis Control System Claims, the term "calling number identification data" appears in context as "receiving said calling numberidentification data." See Claims 33, 104, 117, and 192 of the '707 patent and Claim 171 of the '863 patent. In the Conditional Format claims, the terms appear in context as "call data signals as to indicate ... calling numbers" or "calling numbers as additional call data signals." See Claim 15 of the '150 patent and Claims 17 and 24 of the '285 patent. Products Carrying Participation Numbers Claims, the terms appear in context as "call data signals indicative of calling number identification data." See Claim 44 of the '707 patent and Claim 79 of the '863 These terms appear throughout the Katz patents. The parties agree and the Court concludes that the terms have a consistent meaning across the claims at issue.

The arguments of the parties regarding the proper construction of these terms mostly mirror their arguments regarding "DNIS" and "called number identification data." The plaintiffs argue that these terms mean a signal provided by the telephone network that indicates all or part of the calling number. (Pls.' Appendix at 31, 69). The defendants argue that "ANI" and "calling number identification data" must refer to the entire calling number; do not include routing or billing signals used within the telephone network, and must identify the geographic excluded. The arguments of the defendants will be addressed in turn.

There is no indication in the claim language that "ANI" or "calling number identification data" must be the full calling number; indeed many of the claims call out a signal that indicates the calling number. The specifications do not support the defendants' contention either. In Column 4, lines 62 through 67 of the '707 patent, Katz notes that "ANI capability is a similar function whereby the digital data indicates the calling number with calling terminal digital signals." The defendants contend that because Katz used ten digit phone numbers in his examples in the specifications, the terms "ANI" and "calling number identification data" must include the full seven or ten digit number. In Column 6, lines 62 through 65 of the '707 patent, Katz describes two ways in which the calling number could be transmitted to the Katz system; he notes that "the caller would push the buttons in sequence to indicate his telephone number, e.g. '(213) 627-2222.' Alternatively, the interface 20 can accept the calling number ((213) 627-2222) according to its provision by standard ANI equipment of the communication

facility C." In Column 7, lines 29 through 30 of the '707 patent, Katz notes that "the first portion, section 53, contains a form of identification data, i.e., the caller's telephone number, i.e. '(213) 627-2222."

The first passage of the specifications cited by the defendants is provided as an example of a calling number. It is clear that the number from which a caller is calling would be a full seven or ten digit number; however, the specification is silent about what the *signal* that conveys this number, the ANI or the calling number identification data, would include. The second passage of the specifications cited by the defendants describes an example of *619 data that is stored in a cell as represented in Figure 2, not "ANI" or "calling number identification data." Neither of these passages indicates that "ANI" or "calling number identification data" must include any particular number of digits.

As for the defendants' second argument, the claim language does not support a construction of "ANI" or "calling number identification data" that excludes routing signals or billing signals that are used within the telephone network. This argument is essentially the same as the defendants' argument that "communication facility" means that the Katz system must operate outside of the telephone network, which the Court addressed above and will not repeat here. In short, neither the claim language nor specifications mention routing or billing signals as either included or excluded in the definition of "ANI" or "calling number identification data." Determining whether routing or billing signals are signals which indicate the calling number is not a matter of claim construction, and as such, is not properly before the Court.

Further, the prosecution history cited by the defendants neither confirms their proposed construction of "ANI" or "calling number identification data" nor conflicts with the plain meaning of the terms "ANI" and "calling number identification data" conveyed by the claim language In an Amendment dated April and specifications. 15, 1996 in the prosecution of the '751 patent, Katz attempted to distinguish the '020 patent to Fodale to support his amendment. Katz described the Fodale patent as providing a system which blocks delinquent telephone terminals from making toll calls by comparing routing and billing information provided by the local telephone office against a list of delinquent terminal numbers. Katz notes that in one arrangement in the Fodale patent, ANI provides the calling or billed number. Katz stated that "[n]o reference to ANI can be located in providing the

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caller number, which presumably is otherwise available to the local toll network." (Ex. 67). The defendants contend that Katz was referring to "his" version of ANI in this last statement and distinguishing signals that are sent outside the telephone network from the billing signals or routing signals that are internal to the telephone network. The defendants' interpretation of this statement by Katz is inconsistent with his statement that Fodale uses ANI to provide the calling or billed number in one While the meaning of Katz's arrangement. statements in this Amendment is not completely clear, the Court concludes that these statements clearly do not convey the message that the defendants would attribute to them, that Katz was disclaiming coverage of routing and billing signals.

As for the defendants' final argument, there is no requirement in the claim language that "ANI" and "calling number identification data" must identify the geographic location of callers. The defendants argue that the "ANI" and "calling number identification data" must disclose the geographic location of the caller because the formats disclosed in the specifications use ANI to screen callers based on In his description of a their geographic area. television game show format in Column 18, lines 37 through 44, lines 56 through 62 of the '707 patent, Katz proposes that different questions be used for different geographic locations to accommodate the different time zones and that "area code numbers afford an effective geographic classification of In the context of the discussion of a television poll format in Column 20, line 16 through 22 of the '707, Katz proposes that callers may be screened by geographic area according to their telephone number which is provided by ANI The defendants contend that because 🐸 equipment. Katz uses the geographic location of the callers taken from the calling number in these formats, the Mobile Identification Number or MIN supplied by wireless constitute "calling cannot identification data" or "ANI" because MIN does not supply an *620 accurate indication of the callers geographic location. However, in the discussion of an instant lottery format in Column 12, lines 46 through 47 of the '707 patent, Katz proposes the use of a caller's telephone number and date of birth to qualify a caller based on his age; in this example, the calling number is not used to qualify a caller based on his geographic location. Similarly, Claims 165 and 175 of the '707 patent call out the use of calling numbers for purposes other than determining To adopt the defendants geographic limitations. construction of the terms at issue to always require the identification of the geographic location of the

caller would not only improperly limit the claims by the examples disclosed in the specifications, but also would limit the claims in a manner inconsistent with some of the other examples in the specifications. The Court concludes that there is no basis in the claim language for importing such a limitation.

Based on the foregoing, the Court concludes that "ANI" and "calling number identification data" are synonymous in the claims at issue in the Katz patents and mean: a signal that identifies the calling number, i.e. the number from which a call originated.

9. In-band or Out-of-band Signaling

[38] The defendants have requested that the Court determine whether the patents require the signals indicating the called and calling number as just discussed to be transmitted "in-band," or along a voice channel in the form of analog signals, and not "out-of-band" via an Integrated Services Digital Network (ISDN) connection. The plaintiffs contend that the patents are silent on whether the signals must be transmitted, or in-band or out-of-band, and thus no particular manner of connection or mode of transmission of these signals is required.

The parties presented expert testimony and argument on the difference between in-band and out-of-band signaling. In short, a signal carrying data may be transmitted over a telephone connection that travels in the same channel or line as the voice signal travels; such a data signal is said to be traveling "in-band." Traditional telephone connections are set up in this manner. A signal carrying data may be transmitted over a telephone connection in a channel or line that is separate from the channel or line that the voice signal travels; such a data signal is said to be traveling "out-of-band." An ISDN connection, which provides two voice channels and one data channel in the same connection, is an example of "out-of-band" signaling. A T1 connection provides for 24 channels or lines in the same connection; a data signal may travel in-band with each of the 24 voice channels or out-of-band in one of the channels along with the other 23 voice channels. Defendants' Demonstrative Exhibit 36).

To support their argument that the patents require inband signaling, the defendants contend that the limitation in Claim 96 of the '707 patent which reads "means to provide signals representative of data developed by said remote terminals and for receiving said calling number identification data" is a meansplus-function limitation, and therefore, the Court must determine the structure disclosed in the

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specification that corresponds to the "means." The defendants contend that the only structure disclosed in the specifications is an in-band For support for this argument, the defendants rely heavily on Figure 1 in the '707, '863, and '309 patents. Figure 1 illustrates one hundred calls or lines coming into the Automatic *621 Call Distributor AC1, fifty lines coming from the ACD to the Interface 20, and fifty lines coming out of the Interface 20. See also Column 4, lines 24 through 27 and Column 5, lines 3 through 13 of the '707 patent. The defendants contend that if Katz contemplated that the call data signals would be sent out-of-band, he would have had to show 51 lines going into and coming out of the Interface to allow for the separate data line in an ISDN connection. The defendants contend that Katz's disclosure of in-band signaling in Figure 1 is the structure to which the "means" corresponds. However, Figure 1 is an illustration of how the Katz system may be set up. Even assuming that the defendants' contention regarding the figure is correct, the Court concludes that Figure 1 does not pequire that the signals be sent in- band; it only illustrates that the signals may be sent in-band.

FN25. The defendants also contend that ANI or calling number identification data, and DNIS, or called number identification data signals, even in claims which are not in means-plus-function form, refers to in-band signaling only. However, to support this position, the defendants point to the same claim language and passages of the specification that they rely on to support their means-plus-function argument. Thus, the Court will treat these two issues together.

In addition, the defendants point to Column 4, lines 52 through 58 of the '707 patent, which indicates that the interface for receiving ANI may be a Centrum 9000 or an interface which includes tone decoders. The defendants contend that such interfaces could only receive analog in-band signals, not digital or ISDN signals. However, even assuming that this representation about the capacity of these interfaces is true, the types of interfaces provided in the specifications are exemplary only; they do not indicate that the signals can *only* be sent via one of these interfaces or that the signals can *only* be sent in-band.

In Column 4, lines 52 through 58 of the '707 patent, Katz notes that "the interface 20 incorporates

modems, tone decoders, switching mechanisms, DNIS and ANI capability (call data analyzer 20a) along with voice interface capability." It is clear that the tone decoders and the DNIS and ANI capability of the call data analyzer perform the function of providing and receiving signals from the remote terminals and the communication facility. Thus, the Court concludes that the structures that correspond to the "means" are the Interface 20 and the Call Data Analyzer 20a.

The plaintiffs note that Claim 15 of the '150 patent, a process claim, recites the limitation of "receiving said call data signals from said telephonic communication system for a calling remote terminal," which is not written in means-plus-function form. They argue that the language of this claim in no way indicates the type of line on which the call data signals must be received and because it is not a means-plus-function limitation, it is not appropriate to import structure from the specifications. The Court agrees. In the specification of the '150 patent, in Column 4, lines 12-17, Katz discusses the call data referred to in his claims. The only requirement of the call data signals set forth in the specification pertains to the content of the signal: it must convey the called and calling There is no requirement in the specifications that the signals be sent in a certain manner or over a certain type of line or connection.

The patents are silent as to whether the call data signals must be transmitted "in-band" or "out-of-band." Thus, the Court concludes that the claims at issue do not require or exclude any particular manner of transmission or type of signaling.

10. "Consumable Participation Key" and "Limits on Use"

[39][40] The parties have presented the terms "consumable participation key" and "limits on use" to the Court for construction. "Consumable participation key" appears in Claim 51 of the '309 patent and reads in context "qualification structure controlled by said record structure for testing caller data signals provided by a respective one of said individual callers to specify a consumable participation key for restricting the extent of access to said system to limit data stored from said respective one of said individual callers on the basis of entitlement." The term also appears in Claim 65 of the '863 patent and *622 reads in context "qualification structure for testing caller data signals provided by at least one of said individual callers to specify a consumable participation key, said consumable participation key for use during a single

predetermined period of time for restricting the extent of access to at least a portion of said system by said one of said individual callers on the basis of entitlement."

The term "limit on use" or "limits on use" appears-in Claims 33, 44, and 93 of the '707 patent and Claims 79 and 190 of the '863 patent. Claim 33 of the '707 patent recites in part a "qualification structure controlled by said record structure for testing said calling number identification data to specify a basis for entitlement defining a limit on use, for restricting the extent of access to said system for a respective one of said certain of said individual callers.... An analysis control system according to claim 26, wherein said limit on use relates to a dollar amount." The other claims in which "limits on use" appears are substantively the same; Claim 44 of the '707 is representative and reads "providing products carrying participation numbers specifying limits on use to entitle individual callers to access said operations of the interface with said telephonic communication system."

The parties agree that "consumable participation key" should be defined as a number or word that allows a caller access to a service or part of a service a predefined limited number of times and which cannot be refreshed or recharged. While the ordinary meaning of the claim language gives some indication of the meaning of "consumable participation key," the specification makes it clear. In Column 9, lines 31 through 35 of the '707 patent, the specification provides that "[f]or example, a list may be preserved by a use- rate calculator to implement a consumable key operation. That is, a user is qualified to a specific limited number of uses during a defined interval."

The parties disagree, however, on the meaning of "limits on use." The plaintiffs argue that "limit on use" means "a control imposed on the degree or extent to which callers may avail or utilize a service or one or more operations of a service." (Pls.' App. at 74). The plaintiffs contend that a limit on use can be any one of a range of restrictions including "limits based on the total number of permitted accesses, the time of day for permitted accesses, limits on use based on a dollar value, [and] limits on use based on a predetermined period of time." (Pls.' App. 75-76). The defendants argue that this term has the same meaning as consumable participation key in that it is a control on the number of times a caller may enter a format in the Katz system. The defendants agree that a limit on use can be fixed by a set number of uses or a set dollar amount. However, the defendants argue that a limit on use does not perform a metering function in that it does not effect the duration of access to a format; consequently, it cannot disconnect a caller during a format for exceeding a set period of use.

The place to begin is the claim language. Claim 33 of the '707 patent provides for a limit on use that relates to a dollar amount. The plaintiffs argue that this Claim clearly shows that limit on use is not restricted to only the number of calls or accesses into the system. Although this claim does not explicitly recite that the limit on use would be a duration of time linked to the set dollar amount, e.g. \$10.00 limit at \$2.00 per minute, it does not explicitly recite that the dollar amount could only be linked to a set number of accesses, e.g. \$10.00 limit at \$2.00 per access.

The defendants argue that the limits on use are used to qualify callers for access to the operations of the interface, which necessarily has to occur before the caller enters into the Katz system. However, claim 44 of the '707 patent provides for a further step of "invalidating on-line said participation numbers after said limits on use specified by said participation numbers are *623 reached." This claim calls out a step of utilizing the limit on use at a later point in the process after the qualification step.

The specification confirms that "limit on use" should not be restricted to set number of accesses to the Katz In Column 12, lines 52-57 of the '707. patent, Katz describes how a calling number may be "checked by the use- rate calculator to determine the number of times it has been used in excess of a predetermined number of calls or dollar value to participate in the lottery during a current interval of monitoring." (emphasis added). Similarly, in Column 12, lines 22 through 26 of the '707 patent, Katz describes how a lottery format may use a limit on use and states that "[f]or example, a person might be entitled to play the lottery a limited number of times or to the extent of a limited dollar value during a predetermined interval." (emphasis added).

Contrary to the defendants' assertion, the Court concludes that Katz does not equate all limits on use to consumable participation keys. In Column 9, lines 32 through 35 of the '707 patent, the specification provides that "a list may be preserved by a use-rate calculator to implement a consumable key operation. That is, a user is qualified to a specific limited number of uses during a defined interval." The use of the phrase "limited number of uses," which accurately describes a consumable

participation key, does not indicate that all "limits on use" are consumable participation keys. Thus, it is clear from the claims and specifications that a consumable participation key is only one kind of a limit on use.

There is no indication in the Katz patents of a method of measuring a limit on use based on a dollar value. That is, neither the claims nor the specifications require that the limit on use based on a dollar value be decremented by the number of accesses to the system, ie. \$2.00 for each access. The claims and the specifications leave open the possibility that the dollar amount could be decremented by some other method of measurement, such as time spent in the Katz system; ie. \$2.00 for 10 minutes, such that the limit on use served a metering function.

The statements made by Katz in the prosecution history cited by the defendants do not require a different construction than what is clear from the plain language of the claims and specifications. During the prosecution history of the '707 patent, certain of Katz's pending claims, including pending claim 47, were rejected by the examiner in an office action as unpatentable over two patents and an article of Turbat. (Ex. 51). In an Amendment dated August 31, 1995, Katz amended pending claim 47 by substituting the phrase "one time use" with "limit on Katz also argued against the examiner's rejection of his pending claim 47 in a section entitled "Discussion of the Rejections of Claims 32, 37, 40, 41 and 47 under 35 U.S.C. § 103." In that section, Katz distinguishes the rejected claim 47 on the basis that "[a]pplicant's system, as claimed, is independent of both time (Barger and DeBruyn) and value (Turbat)." However, this discussion was clearly directed toward the rejection of the claim as originally written, which called for "a basis of entitlement defining a one time use," as evidenced by Katz's statement at the end of the discussion section that "[t]he rejected claims are urged to be distinct for... the reasons presented above." Based on this review of the prosecution history, the Court concludes that Katz's statements about a claim that read "one time use" do not limit the claims that were eventually: accepted, which read "limit on use."

Based on the foregoing the Court concludes that "consumable participation key" means: a number or word that allows a caller access to a service or part of a service a predefined limited number of times and which cannot be refreshed or recharged. The Court concludes that "limit on use" means: a control that limits a caller's access to a service based on some

predetermined method of measuring the *624 level of use. The term "limit on use" is not restricted to a specific method of measuring use, such as a limited number of accesses into the Katz system.

B. CLAIMS INVOLVING PRODUCTS CARRYING PARTICIPATION NUMBERS

Claims Involving Products Carrying Participation Numbers are Claims 44 and 93 of the '707 patent and Claims 79 and 190 of the '863 patent. The text of these claims is set forth in the Appendix.

In general, these claims involve a method for limiting a caller's entitlement to access the functions of the system by requiring the caller to enter a participation number. These participation numbers are carried on products that are in some way provided to the caller prior to the call. The participation number corresponds to data stored in memory in the system which specifies a limit on a caller's access to the system.

1. "Products Carrying Participation Numbers"

[41] The plaintiffs contend that the term "products carrying participation numbers" is straightforward and its meaning may be taken from the ordinary meaning of the words themselves. The defendants argue that the words "product" and "carrying" indicate that the product on which the participation number is carried must have inherent value apart from the number; thus, the defendants argue, "products" cannot include prepaid calling cards.

The term "products" is not used in the Katz patents as a term of art, as the parties agree. Thus, the Court should give the term its plain, ordinary English meaning. The Court concludes that the plain meaning of "products," which denotes an item produced for use in a commercial setting, does not support the construction given to it by the defendants. The plain meaning of the term "product" in the claim language does not connote something of inherent value apart from the number carried with it.

The specification does not contradict the plain meaning of "products." The only place in the specification that discusses products carrying participation numbers is Column 17, lines 13 through 17 of the '707 patent, which reads "[a] key to participation in the game show may involve the purchase of a particular product. For example, a person desiring to participate may purchase a product which carries a concealed key number. The number serves as a caller's key to participation in the game

show." This passage in no way suggests that the product must have value independent of the participation number. The defendants also point to Column 9, lines 35 through 38 of the '707 patent, which discusses restricting callers to the purchasers of a medical apparatus. This discussion is given by way of example only and does not indicate that all "products" must have inherent value apart from the participation numbers.

The defendants rely on statements made by Katz during the prosecution of the '707 patent. August 31, 1995 Amendment, Katz distinguished the '275 patent to Kamil by stating that "Kamil discloses a telephone system enabling prepayment for telephone calls, wherein special code and credit information is stored in memory in special exchanges and debited as the call progresses" and that Kamil "does not disclose specific limitation recitations including consumable key operation, nor does it disclose providing a product bearing a participation number specifying a limit on use." (Ex. 51). The defendants argue that Katz clearly stated that his invention was distinct from Kamil because Kamil sused prepaid tickets which do not have inherent value, and thus, are not "products."

The Court concludes that Katz did not unambiguously state that his invention required products with inherent value apart from the participation number; it is possible, *625 for example, that Katz's distinction was based on the fact that Kamil's special code connected with the Exprepayment for telephone calls did not specify a limit on use. Katz did not mention Kamil's use of a prepaid ticket as a method of recording the prepayment in his statements so it is not clear that Katz was using the concept of a prepaid ticket as the In addition, these basis for his distinction. statements were made by Katz in a voluntary amendment, not in an effort to change the examiner's Thus, the Court decision on a rejected claim. concludes that Katz's statements do not indicate a clear disavowal of coverage so as to require that "products" have inherent value apart from the participation numbers. See York Products, 99 F.3d at 1575.

Based on the foregoing, the Court concludes that "products carrying participation numbers" means: a physical item sold or exchanged in a commercial setting which carries a number allowing participation in the Katz system.

2. "Accounting data"

[42] The second term from the Claims Involving Products Carrying Participation Numbers that the parties have presented to the Court for construction is "accounting data." This term appears in Claim 44 of the '707 patent, which includes the step of "providing on-going accounting data to said individual callers at intervals during calls from said individual callers."

The plaintiffs argue that "accounting data" should be construed according to its ordinary, common meaning, which is information relating to a reckoning or a computation. (Pls.' App. 83-84). The defendants argue that "accounting data" means callers' scores in the television game show format because that is the only format in the specifications in which Katz discusses accounting data.

The claim language does not support the construction proposed by the defendants. Nothing in Claim 44 indicates that "accounting data" should be limited to only callers' scores in a television game show format. In addition, Claim 45 of the '707, which is dependant on claim 44, provides for the step of "accounting for said limits on use for said participation numbers for said individual callers by decrementing on-line incrementing or cumulative use for said individual callers to said In this claim, the concept of limits on use." accounting connotes keeping a record of the usage of the Katz system according to set limits on use associated with a caller's participation number; the language of this claim in no way limits the concept of accounting to scores in a game show.

The defendants contend that Column 16, lines 44-53 of the '707 patent is the only place that Katz describes "accounting data." In that passage of the specification, Katz discusses a television game show format and states that:

The participant data is stored in an assigned cell of the memory 98 (FIG.4) for the caller and as the game proceeds, the processing unit 92 tallies the caller's score. Scores are interrelated between individual processing units to actuate the terminal CT. Thus, individual accounting occurs for each of the calling participants on an on-line basis dependant upon the success of the studio players and their association with the callers. On-going accounting data may be provided at intervals or real time by the recorded voice to each contestant.

However, in Column 17, lines 44 through 48 of the '707 patent, the specifications reads "the table 99 may be a large, shared unit that tabulates each of the key numbers and accounts for their use. If the caller has identified a proper key number, the process proceeds and the key number is accounted, i.e. incremented or

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decremented to the limit of use if any." Contrary to the defendants assertion, Katz discusses accounting in this passage of the specification in a context other than a television game show format. This passage of the specification is consistent with the language *626 of Claim 45, which adds the step of "accounting for said limits on use for said participation numbers," and indicates that "accounting data" may relate to the limits on use specified in the participation numbers or consumable key numbers, and not only callers' scores in a game show. Further, even if the only example of "accounting data" in the specification were in the television game show context, the Court finds no reason in the claim language to restrict the term to a disclosed embodiment in the specification. Johnson Worldwide, 175 F.3d 985, 989.

The defendants argue that the prosecution history of the '707 patent supports their construction of "accounting data." In a Supplemental Amendment dated December 28, 1994 during the prosecution of the '707 patent, Katz added Claim 53, which eventually became Claim 37 (upon which Claim 44 depends). In his remarks, Katz stated that "[s]upport for the 'accounting' distinction may be found, for example, at page 34, lines 11-21 of the present specification," which corresponds to the passage in the specifications upon which the defendants rely. The Court concludes that this statement by Katz in no way limits the term "accounting data" to only callers' scores during a television game show format, as evidenced by his use of the phrase "for example."

The claim language and the specification makes it clear that a caller's score in a television game show format is accounting data, but it only one example of accounting data, not the term's definition. Based on the foregoing, the Court construes the term "accounting data" in accordance with its ordinary, common meaning to mean: information relating to a computation of data.

3. "Operations of the Interface"

[43] The third term from the Claims Involving Products Carrying Participation Numbers the parties have presented to the Court for construction is "operations of the interface." This term appears in the preamble of Claims 44 and 93 of the '707 patent and Claims 79 and 190 of the '863. The language containing this term varies slightly in the claims, but generally provides for "[a] process for controlling operations of an interface with a telephonic communication system." The term "operations of the interface" as it appears in the preamble is also referred to in the limitations of the claims, such as "to

access said operations of the interface."

The defendants argue that "operations of the interface" is synonymous with "format." The plaintiffs contend that the term should be construed as "the set of processes or actions that effectuates interactive connection and that is part of the work performed by the system connected to the telephone network." (Pls.' App. at 68).

The claim language does not support the defendants' limited construction of this term. In the second limitation of Claim 37, upon which Claim 44 depends, the claim includes the step of "receiving said call data signals ... to select a specific operating format from a plurality of operating formats of said operations of the interface." This claim recites both the terms "format" and "operations of the interface." The use of both terms separately in the same claim indicates that they have different meanings. addition, the claim refers to selecting one of a plurality of operating formats of the operations of the interface, which shows that the operations of the interface includes more than one format. Further, the term "format" is not present in Claims 93 of the '707 patent or Claim 190 of the '863 patent, which indicates that the operations of the interface do not necessarily include a format.

The term "operations of an interface" is not discussed in the specification. The defendants point out that in Column 10, lines 32, 39, and 43, Katz refers interchangeably to "mail order operating format" and "mail order interface." From this portion of the specification, however, the Court cannot conclude that the operations *627 of the interface can only include a format.

The Court concludes that there is no reason in the claim language or specifications to depart from the ordinary, common meaning of "operations of the interface." Based on the foregoing and consistent with the Court's construction of "interface structure," the Court concludes that the term "operations of an interface" means: the processes, activities, or functions of the interactive connection between the processors upon which the Katz system is running, the communication facility, and the callers. The term does not require that the Katz system be running a format, or specifically, one of the seven formats disclosed in the specifications.

4. "Answer Data"

'[44] "Answer data" is the fourth term the parties have presented to the Court for construction from the

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Claims Involving Products Carrying Participation Numbers. The term appears in Claims 44 and 96 of the '707 patent and Claims 79 and 190 of the '863 patent. The language of the limitations in which "answer data" appears is almost identical in each patent and reads "receiving digital identification data from said individual callers responsive to said voice signals including said participation numbers for said individual callers and answer data developed by said remote terminals under control of said individual callers."

The parties agree that the clear meaning of "answer data" is responses by callers to vocal questions or prompts. The defendants ask this Court to exclude any response that includes a telephone number, and specifically the telephone number of the party the caller would like to reach, from the definition of "answer data."

The defendants argue that the specifications describe callers providing answers to questions only in the context of one of the Katz formats, and because making a telephone call is not a format, a telephone number cannot be included in the definition of "answer data." See Column 7, lines 46 and 59; Column 17, line 8; Column 19, line 17 of the '707 <u>patent</u>. Even taking the defendants characterization of these passages of the specification as true, the Court has already rejected the defendants' narrow definition of the term "format" in the context of these patents. Further, there is nothing in the passages of the specifications cited by the defendants that indicates that answer data could not include any telephone number, including the number the caller is trying to reach.

The Court concludes that there is nothing in the claim language or specification that restricts the ordinary, common meaning of the term "answer data," which denotes data containing answers or responses. The defendants argue that "answer data" cannot encompass all answers to questions because the claims refer to some types of answers with specific terms, such as participation numbers. Although the claims recite different terms to refer to some specific responses received from the callers, the use of these more specific terms does not indicate that the broad term "answer data" cannot encompass these responses as well.

The prosecution history cited by the defendants does not support their construction of "answer data" nor does it limit the ordinary, plain meaning of the term as expressed in the claims. The defendants argue that Katz distinguished his inventions from a patent to Newkirk, which involved a system that enabled callers to make calls at pay telephones using a magnetic stripe on a card. In the prosecution history of the '968 patent in a Supplemental Amendment dated May 4, 1988, Katz stated that:

The Newkirk et al. patent (4,439,636) is directed to a system for enabling a magnetic stripe card to be used at a pay telephone somewhat independently of the composite telephone system. Although the Newkirk patent discloses digital communication between a remote *628 terminal and central terminal, the communication essentially involves the magstripe of a credit card. Distinct from applicant's development, Newkirk does not contemplate any operations related to statistical analysis. Specifically, with respect to the claims herein, while the Newkirk patent utilizes a calendar clock and form records for purposes of billing, the system does not store any form of "answer data."

(Ex. 33). The defendants contend that Katz's statements indicate that a telephone number could not be answer data. The Court concludes that Katz's statement that the Newkirk system did not store any form of answer data does not limit the term "answer data" to exclude responses that include telephone numbers. Katz stated that the only communication between a remote terminal and a central terminal was through the magnetic stripe; such a magnetic stripe would not have constituted "answer data" as this Court concludes that term is used in the Katz patents.

Although not addressed by Katz in his statements regarding Newkirk, the defendants argue that the Newkirk patent provided for callers to be "prompted" by a dial tone to enter the telephone number they were trying to reach. Thus, the defendants argue, Newkirk involved callers' responses to prompts and Katz statement that Newkirk did not include answer data indicates that Katz was disclaiming responses involving telephone numbers from the scope of the term. The Court is not persuaded by this argument for First, Katz did not mention that two reasons. Newkirk prompted callers with a dial tone in his discussion of the Newkirk patent; thus, the Court will not limit Katz's claims by a statement that he did not make during the prosecution of the patents. Second, the patents make clear that the questions or prompt must be vocal or voice generated. [FN26] Thus, the dial tone used in Newkirk is not a "prompt" or "cue" as used in the Katz patents.

FN26. Claim 44 provides support for the notion that the questions or prompts are vocal in nature. The third limitation in Claim 37, upon which Claim 44 depends,

provides for "coupling said remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide vocal operating instructions to specific ones of said individual callers." The specification also supports the idea that answer data is responses to vocal questions or prompts. See Column 7, lines 46 through 53 of the '707 patent.

During the prosecution of the '846 application, Katz distinguished his patent from a patent to DeBruyn. (Ex. 66). In an Amendment dated July 7,1997, Katz stated:

DeBruyn is silent as to the fourth and fifth steps of claim 31. These steps provide: "cueing callers with selected questions from a batch of questions;" and "receiving answer data ... responsive to the selected questions." DeBruyn prompts callers for simple and fixed input: a phone number and a Lotto number, which can be confirmed and corrected in linear fashion. There is no suggestion or disclosure of selected "questions from a batch of questions." DeBruyn does not contemplate a selection of the same or different questions for different callers, from a batch of questions. DeBruyn, by its silence, can not imply cueing callers with those questions, nor receiving answer data in response to those questions.

It is clear that in these statements, Katz was distinguishing his patent from DeBruyn on the basis that DeBruyn did not select questions from a batch of questions or receive answers to those questions from the batch of questions. These statements clearly do not mindicate that answer data cannot include any telephone number, including the number the caller is trying to reach.

Based on the foregoing, the Court concludes the term "answer data" to mean: responses from callers to vocal questions or prompts.

*629 C. CONDITIONAL FORMAT CLAIMS

The Conditional Format Claims include Claim 15 of the '150 patent and Claims 17, 20, 24, and 77 of the '285 patent. In general, the '150 and '285 patents describe a system and a method for interfacing callers with a processing system which can handle multiple callers and run multiple formats. The '285 patent also includes the option of interfacing callers with a live operator who receives prompts from the processing system. Certain of the formats of the

processing system may contain conditions which restrict access to their use by callers; these conditions are stored in memory in the processing system in connection with the corresponding format. Call data, including the called number, the calling number, and the equipment signals, is used by the processing system to select the format the caller wishes to access and to restrict access to formats according to any associated conditions.

Claim 15 of the '150 patent and Claim 17, 20, and 24 of the '285 patent are method claims; Claim 77 of the '285 patent is an apparatus claim. The method claims are very similar and all contain at least four basic steps, including receiving call data signals, selecting a format under control of the call data signals, testing the selected format in relation to the call data signals, and conditionally interfacing said selected format with the calling terminal. The text of these claims is set forth in the Appendix.

The parties' arguments regarding the proper construction of the testing step and the sequence in which the four basic steps in the method claims must be performed are intertwined. The plaintiffs argue that the "testing the selected format step" includes the test referred to in the specification as the "validity bit check," which tests the ANI of the caller against a negative list of "bad" ANIs stored in memory. Under this construction, because the validity bit check may be performed before the selecting step, the testing step could be performed before the format is chosen in the selecting step. The defendants argue that the validity bit check is not encompassed by the testing step, but rather is separately called out in Claim 24 of the '285 patent; thus, as is clear from the claim language, the steps must be performed in the sequence in which they are listed in the claims. The proper construction of the testing step will be addressed first.

1. "Testing the Selected Format"

[45] The first term the parties presented to the Court for construction from the Conditional Format Claims is "testing the selected format." This term appears in all four of the method claims, and reads in context "testing the selected format in relation to said call data signals." Although the claim language is unclear as to whether the test is performed on the format or for the format, the parties agree that "testing the selected format" means the step of performing a test based on conditions associated with a format before a caller is allowed to interact with a format.

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The disagreement surrounds the scope of the testing step. In addition to the argument over whether the validity bit check is encompassed by the testing step, the parties disagree over whether the test must include the use of a control word or control data and whether the test that is performed must be specific to each format or if formats may be conditioned as a The defendants contend that the step of group. "testing" must involve the use of, or "fetching" of, a "control word" to identify the conditions associated with the selected format. The plaintiffs contend that the step of testing does not necessarily include fetching a control word associated with the selected format and that Katz disclosed other types of testing in the specifications that perform this step of the claims. The plaintiffs contend that a test may apply to groups or categories of formats, or to all of the The defendants contend that the testing step cannot *630 perform the function of excluding a acaller from accessing any formats at all but rather, the testing step determines whether conditions specific to the selected format are satisfied.

The claim language of the testing step is helpful, but not conclusive. The language of the claims does not clearly indicate what the step of testing the selected format involves. The Conditional Format Claims recite "testing the selected format," which indicates that the test is performed on one particular format that has in some way been selected. language does not indicate whether or not the same test could be given to a group of formats or if all formats could be tested for a single caller at the same time. Claims 11, 12 and 13 of the '150 patent, which like Claim 15 depend on Claim 10, add the steps of "fetching control data addressable with said call data for use in the step of testing," "composing a control word defining conditions for interfacing," and "fetching data to specify time constraint conditions." These claims specifically call out the steps of composing a control word and fetching control data, which suggests, consistent with the concept of claim differentiation, that the concept of control data is not necessarily implicit in the testing step of independent Claim 10. The claim language does not preclude the possibility that testing other than based on a control word could be encompassed in the testing step. Thus, the analysis must proceed to the respective specifications.

The specifications of the patents describe three main types of testing that are performed on calls. The first type of testing is performed using a control word or control data, which is available for each format and imposes any conditions on accessing the format. See Column 5, lines 21 though 25 of the '150 patent.

Column 6 lines 54 through 57 of the '285 patent provides that "a control word is available for each operating format of the processor P and is utilized to impose the conditions for an interface and the terms of any associated billing." Similarly, in Column 9, lines 3 through 7, the specification provides "each of the operating formats has a control word for defining any access conditions or limitations to accomplish a specific format." Katz explains that the control words are bits in the control register which indicate the presence and content of conditions associated with a format. See Column 9, lines 27 through 37 of For example, Katz describes test the '285 patent. conditions based on the time of the call, the calling history of the caller, and the demographics of the caller. See Column 9, line 37 through Column 10, line 9 of the '285 patent.

specification also discusses testing conditioning calls as a group. For example, the specification provides "the [historical] record might take the form of either a negative or a positive file (for an individual format). In that regard, formats involving 'pay to dial' calls might be conditioned as a group." Column 5, line 64 through Column 6, line 2 of the '150 patent. Katz also describes "decimal equivalent coding" as a way to condition formats as a group. Katz states that all formats of a particular type may be assigned in a "decimal series," such that all lotteries would be assigned a number in a "100" series, e.g., 101, 102, 103, etc. For example, a caller's ANI may be associated with a decimal series which would exclude that caller from participation in any formats in that decimal series. See Column 10, lines 27 through 30 of the '285 patent. specification provides that decimal equivalent coding "enable[s] a substantial number of formats to be designated and coded with respect to various classifications." Column 8, lines 5 through 17 of the '150 patent; Column 10, lines 10 through 30 of the '285 patent.

Katz also discussed what he refers to as the validity bit check. The validity bit check compares the ANI, or calling number, of the caller to a list of ANIs that are stored in memory. If it is a negative list and the caller's ANI appears on the list, *631 the caller will be denied access to the Katz system regardless of the format. If it is a positive list, the caller's ANI must appear on the stored list in order to access the Katz system regardless of the format. See Column 4, line 60 through Column 5, line 5 of the '150 patent. It is also possible that the calling equipment may appear on a stored list which determines a caller's access to any of the formats. See Column 5, lines 1 through 14 of '150 patent.

It appears both side agree that Claim 24 of the '285 patent corresponds to the validity bit check described in the specification. The claim provides for "storing a record of negative file data, said select processing format using said additional call data signals to access said record and obtain data to specify and test for negative file conditions." The defendants say that Claim 24 does not alter the testing step of the independent claim; rather, the defendants argue it is an additional step that occurs before the testing step.

The Court concludes that, based on the claim language and the specifications, the testing step does not encompass testing formats as a group, such as through the decimal equivalent coding or the validity bit check disclosed in the specifications. The clear language of the claim recites testing "the selected" According to the specification, decimal format. equivalent coding is performed on a group of formats at one time and does not operate on the format that is selected by the call data signals. Thus, the Court invokes the legal rule that the specification may not expand the clear meaning of the claim language. As well, the specification shows that the validity bit check is based on the ANI or equipment signal of the caller and is not associated with any conditions placed on a selected format. Based on the foregoing, the Court concludes that "testing the selected format" means: the method by which it is determined whether any conditions associated with the format # that has been selected by the call data signals are satisfied.

2. The Sequence of Steps in the Method Claims

The parties disagree over the sequence in which the four basic steps in the method claims, i.e., receiving call data signals, selecting a format, testing the selected format, and conditionally interfacing, must be performed. Specifically, the disagreement centers around the sequence of the selecting and testing The defendants contend that there is a steps. presumption that the steps in a method claim must be performed in the order they are listed in the claim particularly where, as here, the claim language indicates that the testing step must follow the selecting step. The plaintiffs contend that in some embodiments of the invention the testing step could be performed before the selecting step, particularly a situation where a group of formats are being tested, such as the validity bit check.

[46][47] Where the plain meaning of the claim language indicates a sequential nature to the claim steps and the specification does not suggest

otherwise, the steps must be performed in the order written in the claim. See Mantech Environmental Corporation v. Hudson Environmental Services, Inc., 152 F.3d 1368, 1376 (Fed.Cir.1998). The testing step provides for "testing the selected format," which suggests that the format must be selected before this step can occur. While the specification does indicate that the validity bit check and other testing of formats as a group may occur before the selection of the format, the Court has already concluded that the validity bit check and other group testing is not encompassed by the testing step. Given the clear language and the suggested sequence of the steps provided in the claims, the Court concludes that: the testing step must be performed after the selecting

There is also some disagreement over the sequence in which the additional steps other than the four basic steps should be performed in the method claims. Claim 11 *632 calls out the additional step of "fetching control data addressable with said call data for use in the step of testing." Claims 15 calls out the additional step of "fetching data to specify demographic conditions." Thus, the Court concludes that it is clear from this claim language and the passages of the specifications discussed above regarding control words that: the steps of fetching in Claim 11 and Claim 15 must occur before the testing step.

Claim 20 of the '285 patent contains the additional steps of "selectively terminating certain select calls from said remote terminals in favor of said operator attended terminals" [FN27] and "transferring substantially all of said certain select calls from said operator attended terminals back to said multiple port, multiple format data processing system." The defendants argue that these steps must be performed after the four basic steps that appear before them in the claim.

<u>FN27.</u> Claim 24 of the '285 also contains the step of selectively terminating certain select calls.

Claim 24 of the '285 patent includes the steps, in addition to the four basic steps, of "providing signal-represented call data from said remote terminals including calling numbers as additional call data signals" "storing a record of negative file data, said select processing format using said additional call data signals to access said record and obtain data to specify and test for negative file conditions," and

"terminating calls from said remote terminals if said calling number matches said data obtained from said negative file data." The defendants argue that the selectively terminating step must be performed after the four basic steps and the providing step, the storing step, and the terminating step must be performed before the four basic steps are performed.

As for the additional steps in Claims 20 and 24 of the '285 patent, the defendants do not point to any passages of the specification that demonstrate that the additional steps in those claims must be performed in any particular order. There is nothing in the claim language that suggests that those steps must be performed before, after, or during the four basic steps called out in the claims. Interpreting the plain claim language, there is no reason why calls could not be transferred to a live operator or transferred back to the system at any time during a call. Similarly, there is no reason shown in the claim language why a call could not be terminated at any time if the calling number matched negative file data. Thus, the Court concludes that: the claims do not require that the additional steps of Claims 20 and 24 be performed in any particular order.

3. "Call Data Signals"

.TL [48] The term "call data signals" which appears in the "testing the selected format" limitations also raises construction issues for the Court. In Claim 15 of the '150 patent and Claim 17 of the '285 patent, the term "call data signals" appears in the preamble and reads "call data signals, as to indicate called and calling numbers." In Claims 20 and 24 of the '285, the term "call data signals" is not limited in the preamble or elsewhere in the claim to called and calling numbers. The parties agree that in those claims, "call data signals" refers to called numbers, calling numbers, and equipment signals. Column 4, lines 53 through 58 and 65 through 68 of the '285 patent.

The parties dispute the meaning of the term "equipment signals." Specifically, the defendants contend that "equipment signals" is limited to the signal disclosed in the specification, which is a signal that indicates whether the caller is using a touch tone telephone or a rotary dial telephone. Column 3 lines 65 through 68 of the '150 provides that "the call data may specifically include digital signals representative of the called number, the calling number (terminal number) and the terminal equipment." Column 4, lines 10 through 28 of the '150 patent provides that call data may be provided by the communication *633 facility for the called number, the calling

number, and "equipment, e.g. [exempli gratia] 'pulse' or 'tone' terminal." These passages of the specification do not require that the equipment signal only indicate whether the caller is calling from a pulse or tone terminal.

Column 11, lines 28 through 36 of the '285 patent' provides that "[t]he bits '29' and '30' comprise a field 83 and may actuate a special form of the selected In the disclosed embodiment, the field 83 registers call data, as to indicate that the calling terminal is a 'pulse' (rotary dial) signal unit or a 'tone' (touch) signal unit." Field 83 in Figure 5 is labeled "equip." The plaintiffs argue that by dedicating two bits in memory for the equipment signal, Katz indicated that equipment signals may encompass more than touch tone or rotary, because only one bit would have been required to store that information. In light of the specification and Figure 5, the Court concludes that "equipment signal" is not limited to a signal indicating whether the caller is using a touch tone or rotary phone and means: a signal that provides information about the equipment from which the caller is making a call.

Another dispute the parties raised in connection with the term "call data signals" is which call data signals may be the basis for a test in the testing step. The defendants argue that the only call data signal that can be tested in the testing step is DNIS. defendants argue that the equipment signal cannot be tested because equipment signals for touch tone or rotary phones did not exist at the time of the Katz patents. Putting aside whether an equipment signal that indicated rotary or touch tone phones existed at the time of the Katz patents, the specification clearly indicates that the equipment signal may be the basis for disqualifying callers from interfacing with a format. See Column 5, lines 1 through 4 of the '150 The claims language of the testing step is "testing the selected format in relation to said call data signals." Although Claim 15 of the '150 patent and Claim 17 of the '285 patent do not include equipment signals from the scope of call data signals in the preamble, there is no basis in the claim language or the specifications to conclude that the call data signals in the testing steps in Claim 20 and 24 of the '285 cannot include the equipment signal.

The defendants also argue that ANI cannot be included in the call data signals of the testing step because Katz disclaimed coverage for testing ANI in the prosecution history. The specifications clearly indicate that a caller's ANI may be used to disqualify him from interfacing with a format. See Column 4, lines 61 through 68 of the '150 patent. In the June

23, 1993 Supplemental Preliminary Amendment during the prosecution of the '285 patent, Katz distinguished his invention from a patent to Fisher by stating that "the patent to Fisher does not disclose receiving calls from random or unknown callers at large and limiting access upon testing imposed conditions specified by call data including DNIS (Ex. 50) (emphasis in from unknown callers." original). Contrary to the defendants' assertions, the Court concludes that Katz's statement, "call data including DNIS," is not exclusionary or limiting language and does not exclude ANI from the term "call data signals" in the testing step. Thus, the Court concludes that: the call data signals in the testing step may include the calling number or ANI.

4. "Conditionally Interfacing"

[49] The parties also dispute the meaning of the term "conditionally interfacing the selected format." The parties agree that if the testing step is satisfied, that is, the test is performed and the conditions are fulfilled, then the caller is connected to the selected format. The defendants contend that if the conditions associated with the format are not satisfied in the testing step, the caller is not connected to the format. The plaintiffs contend that the *634 claims are silent as to what happens if the tested conditions are not satisfied.

The term "conditional interfacing" in the context of the Katz patents connotes that the caller will be connected or interfaced with the selected format if any conditions associated with that format are satisfied. The term in itself does not connote what happens to the call if the format conditions are not satisfied, other than the call will not be interfaced with the format.

The specification provides that after the tests have been performed, "[i]f the call is accepted, the process moves to initiate the selected format interface as indicated by the block 40. Conversely, if the call is to be rejected, the process moves to the step indicated by block 32, i.e. reject the call as with a message and release the line." Column 6, lines 34 through 41 of the 150 patent; Column 8, lines 4 through 6 of the '285 patent (identical provision). Figure 2 of the '285 and '150 patents, which are flow diagrams illustrating the operating process of the system, indicate that if the tests are not correlated, i.e. the conditions are not met ("No" at 48), the call flows in the direction of the arrow to 32, and the caller receives a reject message (32) and the line is released (34).

The specifications indicate that one possible result from a call in which the conditions associated with the selected format are not satisfied is that the call will be rejected and the line released. However, there is nothing in the specifications or the claim language that requires a call to follow the disclosed embodiment in Figure 2 and the specifications reciting the embodied result of rejecting the call and releasing the line. Further, the term "conditionally interfacing" does not in itself raise the question as to what happens to the call if the conditions are not satisfied other than that the call it not interfaced with a format, and there is no other language in the claims that otherwise restricts what happens to a call if the conditions of a format are not satisfied. The Court will not import the limitation on the claim language proposed by the defendants from the specification because there is no "hook" in the claim language on See Renishaw which such a limitation can hang. PLC v. Marposs Societa' per Azioni, 158 F.3d 1243, Thus, the Court 1248, 1252 (Fed.Cir.1998). concludes that the claims does not require that the call be terminated if the conditions are not satisfied and the call is not interfaced.

Based on the foregoing, the Court construes the term "conditionally interfacing" to mean: connecting a call to the selected format once any conditions associated with that format have been satisfied.

5. "Live Operator Attended Terminals"

[50] The dispute surrounding the term "live operator attended terminals" centers on whether the prompts provided to the live operators must be identical to the vocal prompts in the automated formats. The plaintiffs contend that the prompts need only assist the operator with the call; the defendants contend that the prompts must simulate the automated format completely.

The claim language does not restrict the prompts displayed to live operator attended terminals in any way. The language of most of the claims at issue from the '285 patent calls out "a plurality of live operated attended terminals." Claim 17 of the '285 patent merely refers to "one of a plurality of operator stations with prompting capability."

As well, the specification does not indicate that the prompts to the live operator must mimic the automated formats. In Column 3, lines 20 through 24 of the '285 patent, the specification indicates that the processor provides formats to automate an interface or prompt a live operator at an operator station. In Column 5, lines 25 through 27 of the '285

patent, the specification provides that the operator station upon receiving a call receives and displays prompting format data for the attending *635 operator. Similarly, Column 6, lines 10 through 14 of the '285 patent indicates that when a caller is coupled to an operator station, the appropriate format data is transferred to the station for prompting the operator.

The Court concludes that: there is no indication in the claim language or the specification that the prompts displayed at the operating stations must be identical to the vocal prompts used in the automated formats. Thus, the Court concludes that: the Claims at issue are not restricted in that way.

6. "Selecting a Processing Format"

[51] The dispute surrounding this limitation is over which data signals control the selection of the format. As discussed above, in Claim 15 of the '150 patent and Claim 17 of the '285 patent, the limitation which reads "selecting a processing format of said multiple port, multiple format processing system for the calling remote terminal under control of said data signals as the selected format" indicates that the format is selected by the called and calling number, because "said" data signals are listed in the preamble of the claim as the called and calling number. However, in Claims 20 and 24 of the '285 patent, the data signals are not limited in the preamble of the claim; thus call data signals refers to the calling number, the called number, and the equipment signal.

The parties appear to agree that, despite the claim anguage "data signals," the only call data signal that selects the format is DNIS, or the called number. The specifications support this position. See Column lines 30-31 of the '285 patent ("[T]he call unit CU might be reached by any of twenty telephone dialing numbers, each associated with a specific operating format of the processor P. One called number or set of numbers might be associated with an auction format of the processor P."); Column 5, lines 18 through 24 of the '150 patent ("If a positive validity bit ('1') is formed at the junction of the query block 30, a control word is fetched under command of the called number as indicated by the block 36."); Column 7, lines 13 through 19 of the '150 patent ("The control register 70 receives format control words specified by the called number and having a form as illustrated in Fig. 4."). The Court agrees that despite the use of the broad term "call data signals" in the claim language, it is clear in the context of the patent as a whole that the only call signal that could be used to select a format is the called number or DNIS.

7. "Demographic Conditions"

[52] Claim 15 of the '150 patent recites "[a] process according to claim 11 wherein said step of fetching control data includes fetching data to specify demographic conditions." The parties disagree over the construction of the term "demographic conditions." The plaintiffs argue that "demographic conditions" refers to conditions based on the geographic location of the caller. The defendants contend that "demographic conditions" pertain only to the area code of the caller.

It is clear from the specification that the term "demographic conditions" does not have its ordinary and common meaning in the context of the Katz patents, as both parties agree. In the context of discussing various tests or conditions that may be imposed, the specification provides that "[m]oving from the historic considerations, demographic tests may be specified as in relation to the geographic area manifest by the area code of the calling number." Column 6, lines 24 through 27 of the '150 patent. See also Column 12, lines 19 through 25 of the '150 patent. Katz lists several examples of "demographic conditions" in Column 7; lines 61 through 68 of the '150 patent. While all of the examples are conditions limiting calls based on a particular area code, one of the examples is a condition that limits calls to ANIs from a particular area code with particular prefix numerals.

*636 The Court concludes that although the specification discusses demographic conditions in terms the area codes of the calling numbers, there is nothing in the specification that indicates that an area code can be the *only* basis for a demographic condition. Indeed, in one of the examples provided in the specification by Katz, the callers' area codes are used in conjunction with the prefix numerals of the calling numbers to indicate the callers' geographic area and limit the calls from a particular area. This convinces the Court that "demographic conditions" are not restricted to conditions based on the callers' area codes only. Thus, the Court construes the term "demographic conditions" to mean: conditions used to limit a call based on the caller's geographic area.

8. "Means for Directly Forwarding"

[53] Claim 77 of the '285 is an apparatus claim and contains a limitation which reads "means for directly forwarding a call coupled to said interface means for forwarding a call from any one of said remote terminals to one of said plurality of live operator

attended terminals under control of said call data signals when said remote terminals do not have the capability to digitally provide data."

The parties agree that this limitation is subject to means plus function analysis under § 112, \P 6. The function performed by the "means" is directly forwarding a call from a remote terminal to a live operator attended terminal. The defendants argue that although there is no structure that is clearly linked in the specifications to the function disclosed in the claims, this Court should identify the switch SW, line capture unit 62, call register 68, and the control unit 66 from Figures 1 and 3 of the '285 patent as the structures that correspond to the means.

Figure 3 illustrates elements of the switch SW in Figure 1. See Column 8, lines 32 through 34 of the '285 patent. Column 8, lines 50 through 57 of the 285 patent describes some of the elements of Figure 3 and provides that "[t]he line capture unit 62 also is Structurally, the connected to a control unit 66. control unit 66 may take the form of various computer facilities incorporating memory and logic capability to sequence and control specific functions.... Generally the control unit 66 functions.... Generally the control unit 66 implements specific formats which may involve coupling a caller either to a live operator station OS1-OSn or to the processor P." Column 12, lines 55 through 59 of the '285 patent indicates that "[i]f the call register 68 does not receive a validity '1' bit, the a calling number is indicated to be barred with a consequence that the line is released by the control munit 66."

The Court concludes that based on the specifications, the structure that corresponds to the means is generally the switch SW in Figure 1 and specifically the control unit 66 in Figure 3. Based on the their descriptions in the specifications, the Court concludes that the other structures identified by the defendants, the line capture unit 62 and the call register 68, do not perform the function of directly forwarding a call from a remote terminal to a live operator attended terminal recited in the claim.

The defendants argue that because the claim also requires that the forwarding occur "when said remote terminals do not have the capability to digitally provide data," it does not apply in a situation in which a caller with a touch tone telephone fails or chooses not to push a button on the telephone. The Court concludes that in light of the ordinary and common meaning of the term "capability," this claim means that: a caller is switched to a live operator only when the remote terminal from which the caller

is calling is not technically capable of digitally providing data.

D. CLAIMS FROM THE '984 PATENT

The parties have presented Claims 4 and 15 of the '984 patent to the Court for *637 construction. The text of these claims appears in full in the Appendix.

In general, the '984 patent describes a system for use with a telephone network that controls callers' access to interactive voice applications to prevent misuse. The system can restrict callers' access to interactive voice applications by qualifying calls in different modes, such as "800" mode, "900" mode, or area code mode.

1. Claim 4

a. "First Response Unit Means"

[54] The first term presented by the parties to the Court for construction from the '984 patent is "first response unit means." The term in context reads "first response unit means for receiving calls in said '800' call mode." The plaintiffs argue that this term is not subject to means-plus-function analysis, despite the use of the word "means."

The Court concludes that "first response unit means" is not subject to means plus function analysis, despite the presumption to the contrary due to the word The article presented by the plaintiffs, entitled "AT & T 2: Reaches Agreement with Rockwell" and dated August 26, 1986, discusses the use of audio response units in merging computer speech technology with automatic call distribution systems. (Ex. 362). The Court concludes that this article demonstrates that the term "audio response unit" or "ARU" was used by people in the art of computer telephony and would have connoted sufficient structure to those of ordinary skill in the art at the time. See Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583 (Fed.Cir.1996).

The parties also dispute the meaning of the term "800 call mode" which appears in the same limitation. The plaintiffs contend that this term encompasses "800," "888," and other "toll-free" calls. The defendants agree with this construction, but argue that the term encompasses any call in which the charges are reversed and the call is free to the caller, including foreign access calls and "collect" calls.

Column 1, line 66 through Column 2, line 2 of the '984 patent provides that "[t]elephone calls may be

accommodated without charge using '800' service or calling mode. Generally, the '800' calling mode accommodates free calls by callers in various areas to a particular station incurring the charges." The Court concludes that it is not proper to determine at the construction stage whether "foreign access calls" and the like are specifically encompassed in the term "800 call mode." The Court agrees with the parties that the proper construction of "800 call mode" is: a toll-free call, ie. a call in which the caller is not charged for the call, such as an "800" or "888" call and the like.

b. "Qualification Means"

[55] The term "qualification means" appears in context as "qualification means for qualifying said calls in said '800' call mode received by said first response unit to provide qualified calls." The parties agree that this term is subject to means-plus-function analysis under \S 112, \P 6.

Column 4 lines 9 through 14 of the '984 patent provide that "with overall supervision by the control unit 28, the audio response units, 18, 20, and 22 answer and preliminarily qualify callers from the terminals T1-TN for connection through the coupler 24 to the interface processor 26." Column 4, lines 47 through 50 provide that "'[t]he audio response unit 18 is coupled to a free-call memory 32. Generally, operates with the control unit 28 to qualify acceptable acalls in the '800' mode."

The Court concludes that "qualification means" is subject to means-plus- function analysis. The Court concludes that the structures which correspond to the means and perform the function of qualifying said calls in '800' call mode are the audio response unit 18, control unit 28, and the free-call memory 32 in Figure 1 and the *638 required software to perform the function of qualifying callers.

c. "Second Response Unit Means for Receiving Calls in a Second Call Mode"

[56] The third limitation in Claim 1 of the '984 patent, upon which Claim 4 depends, provides for a "second response unit means for receiving calls in a second call mode." The parties dispute the meaning of the term "second call mode." The plaintiffs contend that the second call mode could encompass anything other than the 800 call mode, which is called out in the first limitation of the claim. The defendants contend that the second call mode must encompass a 900 call mode because a 900 call mode

is called out in the preamble to the claim.

The preamble of Claim 4, which appears Claim 1, reads in part "[a] telephone call processing system for receiving calls from a multitude of terminals in different call modes including an '800' call mode and a '900' call mode." The central dispute is whether the recitation of " '900' call mode" in the preamble is a limitation on the claim such that the second call mode called out in the third limitation must be a 900 call mode.

[57] In determining whether the preamble is an additional limitation to the claim, a court must divine the function that the words of the preamble serve. If the claim preamble recites structural limitations of the invention, a court should consider the preamble a limitation on the claim. See Rowe v. Dror. 112 F.3d 473, 478 (Fed.Cir.1997). If the claim preamble recites a purpose or intended use for the invention in the preamble and the claim body recites a structurally complete invention, the preamble is not a claim limitation. Id. The patent as a whole should be reviewed to determine whether the preamble is structural or a mere statement of the purpose or use of the invention. Id.

The preamble of Claim 1 of the '984' patent calls out a system "for receiving calls from a multitude of terminals in different call modes including an '800' call mode and a '900' call mode." This quoted language does not invoke or refer to any structure of the invention. Similarly, the second response unit limitation recites that the second response unit receives calls in a second call mode. This language describes no structure as well. Thus, the Court concludes that the plain language of the Claim 1 indicates that the term "900 call mode" describes a function of managing the calls or a use of the invention, rather than a structural component of the system.

The specification is consistent with the claim language. Column 1, lines 54 through 66 of the '984 patent provides that

[t]he '900' calling mode is useful for implementing games and contest with telephone interface systems; however, certain problems are encountered. Specifically, certain telephone terminals, e.g. pay phones, do not accommodate '900' service. Also, with respect to certain forms of games and contests, it is important to offer members of the public an alternative 'free' method of participation. In general, the system of the present invention may be employed to implement '900' calling modes while accommodating 'free'

participation with reasonable control.

This passage indicates that the invention may be used with a 900 call mode as a method of solving the problems discussed in the specification. Column 2, lines 3 through 17 discusses the problems with using traditional area code numbers with interface systems, including the possibility that an overwhelming number of people will respond. This passage indicates that another use of the invention is addressing problems with area code calls. Thus, the Court concludes that using a 900 call mode is only one of the uses of the invention.

Based on the claim language and the specification, the Court concludes that "'900' call mode" as used in the preamble of Claim 1 is more descriptive of an intended use of the invention than of its structure, *639 and thus, should not be construed as an additional limitation on the claim. Therefore, the Court will not construe the term "second call mode" to require the use of a "900 call mode" on this basis.

The defendants also argue that the prosecution history of the '984 patent requires that the second call mode be defined as the 900 call mode. In an Office Action dated March 21, 1991, the examiner rejected certain of Katz's claims as unpatentable over Fodale, including Claim 1. (Ex. 32). In the June 20, 1991 Amendment, Katz amended Claim 1 to specifically Call out an 800 call mode and a 900 call mode in the preamble, just as the language appears in the claim as The defendants contend that Katz it was issued. included a "900 call mode" in Claim 1 in the June 20, 11991 Amendment to traverse the examiner's rejection of that claim, and thus, the term "second call mode" in the claim should be limited to the 900 call mode called out in the preamble of the claim.

The Court's careful independent review of the prosecution history, including the basis for the examiner's initial rejection of Claim 1, the amendments made by Katz, and the discussion in the amendment by Katz of the rejection of his claim as unpatentable over Fodale, reveals that the prosecution history cited by the defendants does not support their argument that "second call mode" should be limited The defendants point to no to "900 call mode." affirmative statement by Katz in his amendment that the term "second call mode" was synonymous with 900 call mode nor does the Court find any such statement by Katz. The mere addition of the term "900 call mode" in the preamble does not indicate that Katz was necessarily limiting the term "second call mode" because there is no statement in the prosecution history relating those two terms to each other. Katz did not in his June 20, 1991 submission

amend in any way the use of the term "second call mode" in Claim 1, which left that limitation without reference to the term "900 call mode."

Further, in the same June 20, 1991 Amendment, Katz amended Claim 2 to specifically call out a system wherein the second response unit receives calls in 900 call mode. It may be plausibly inferred that Katz added the phrase "900 call mode" in the preamble of Claim 1 to support his amended Claim 2, rather than to specifically overcome the examiner's objection based on Fodale. Thus, the prosecution history is at best ambiguous as to why Katz added the term "900 call mode" in the preamble of Claim 1. Because Katz did not clearly disclose his intention to do so, the Court will not limit the plain meaning of the claim language based on this ambiguous prosecution history.

Based on the foregoing, the Court concludes that "second call mode" means: a call mode, such as a 900 call mode or an area code mode, other than 800 call mode. The term does not necessarily mean the 900 call mode.

d. "Means for Processing Calls in an Interface Format"

[58] The parties agree that this limitation of Claim 4 of the '984 patent is subject to § 112, ¶ 6. The function performed by the means is processing calls in an interface format. The plaintiffs identify the interface processor 26 as the corresponding structure. The defendants contend that the structures that correspond to the means are the processor 26, random number generator 40, question memory 38, caller record 44, coincidence detector 42 and gate 46 of Figure 1, plus the associated software in Figure 2. The defendants contend that the software must be configured to implement a contest that provides questions to callers, receives answers entered by the callers on the keypad of their telephones, and determines winners of the contest.

The structures identified by the defendants are discussed in Column 8, line 65 through Column 9, line 57 and Column 4, line 57 through Column 5 line 18 as part of the illustrative embodiment of a game format. *640 In Column 6, lines 63 through 66, the specification provides that "the interface processor 26 receives the calling number and processes the contest format as described in detail below." Thus, the Court concludes that the structure that performs the function of processing calls in an interface format is the interface processor 26 of Figure 1. The Court concludes that the structures that are discussed in the

context of the game format are not necessarily required to perform the function of processing calls in an interface format, because the game format is only an example of one type of interface format.

2. Claim 15

a. "Memory Means for Storing Caller Cues and Use Indications"

[59] The plaintiffs agree that all of the limitations of Claim 15 are subject to means-plus-function analysis except for the limitation that reads "memory means for storing caller cues and use indications for said caller cues in relation to said callers as identified by said identification signals." Consistent with the Court's conclusion above in footnote 14, the Court concludes that "memory means" would have connoted sufficient structure to one of ordinary skill in the art at the time of the Katz patents such that it is not subject to analysis under § 112, ¶ 6. The Court defines "memory means" as computer hardware that stores information, such as disks, RAM, or tapes.

The defendants also contend that the "caller cues" recited in this limitation must be quiz or lottery questions, as disclosed in the specification. Similar to the defendants' argument that the term "format" should be restricted to the seven disclosed formats, the Court concludes that there is no support in the claim language or specification for limiting the ordinary and common meaning of "cues" to only questions posed in a quiz or lottery. Thus, the Court construes the term "caller cues" to mean: questions for prompts which are given to a caller.

b. "Means for Selecting a Current Caller Cue"

patent reads "means for selecting a current caller cue from said memory means for one of said currently active callers for application to said cue means under control of said identification signals for said one of said currently active callers and said use indications in said memory means for said one of said currently active callers."

There is no dispute that the term "means for selecting a current caller cue" is subject to meansplus-function analysis. The function performed by the means is "selecting a current caller cue from said memory means for one of said currently active callers under control of said identification signals ... and said use indications." The parties' dispute centers on whether the random number generator is one of the structures that correspond to the means.

The defendants contend that in addition to the gate 46, the interface processor 26, the coincidence detector 42, and the associated software, the random number generator 38 is essential to perform the function called out in the claim because the specification does not provide for a way to choose questions other than randomly. The plaintiffs contend that the specification shows that the coincidence detector 42 is the structure which decides whether a question is posed to a caller based on use indications associated with that caller.

The specification describes the process of selecting a caller cue in Column 4, lines 59 through Column 5, line 1, which provides that "[g]enerally, the interface processor 26 poses questions to calling contestants.... Questions given to contestants are selected from a memory 38 by a random number generator 40. Essentially, the memory 38 contains an inventory of questions addressable by number provided by the random number generator 40. The *641 address numbers for the generator 40 are also supplied to a coincidence detector 42 that also receives the address numerals of questions previously presented to a specific caller from a record 44." See also Column 8, line 65 through Column 9, line 28.

Thus, based on these passages of the specification, the Court concludes that the "means" in "means for selecting a current caller cue" corresponds to the interface processor 26, the coincidence detector 42, the random number generator 38, and the associated software to perform the function of selecting a current caller cue from memory under control of identification signals and use indications.

III. CONCLUSION

The foregoing constitutes the Court's construction of the terms presented by the parties from the twenty claims designated for the <u>Markman</u> hearing.

An appropriate Order follows.

ORDER

AND NOW, this 26th day of August, 1999, upon consideration of the briefs, expert testimony, and oral argument presented by the parties in connection with the <u>Markman</u> hearing held from May 24, 1999 through June 4, 1999, in which counsel for all parties participated, and upon consideration of the intrinsic and extrinsic records of the patents-at-issue as indicated in the foregoing Memorandum, it is hereby **ORDERED** that the meaning and scope of the patent claims asserted to be infringed and presented by the

parties for construction are hereby determined as set forth in the foregoing Memorandum.

APPENDIX ANALYSIS CONTROL SYSTEM CLAIMS '309 Patent, Claim 51

46. A control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said control system comprising:

an interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication, and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers:

record structure, including memory and control means, connected to receive said caller data signals from said interface structure for updating a file and storing digital caller data relating to said individual callers provided from said digital input means through said interface structure; and

qualification structure controlled by said record structure for testing caller data signals provided by a respective one of said individual callers to specify a consumable participation key for restricting the extent of access to said system to limit data stored from said respective one of said individual callers on the basis of entitlement.

51. A system according to claim 46 wherein said qualification structure restricts the extent of access by said respective one of said individual callers to a single use entitlement.

'707 Patent, Claim 33

26. An analysis control system for sue with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for *642 providing data and wherein said communication facility has a capability to automatically provide calling number identification data for at least certain of said

individual callers, said analysis control system comprising:

an interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers;

record structure, including memory and control means, connected to receive said calling number identification data provided automatically by said communication facility for at least certain of said individual callers, for accessing a file, and storing additional digital data provided by said callers; and

qualification structure controlled by said record structure for testing said calling number identification data to specify a basis for entitlement defining a limit on use, for restricting the extent of access to said system for a respective one of said certain of said individual callers.

33. An analysis control system according to claim 26, wherein said limit on use relates to a dollar amount.

<u>'707 Patent,</u> Claim 104

96. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data wherein said communication facility has a capability to provide call data signals indicative of calling number identification data for at least certain of said individual callers, said analysis control system comprising:

interface structure coupled to said communication facility to interface each of said remote terminals for voice and digital communication, and including means to provide signals representative of data developed by said remote terminals and for receiving said calling number identification data;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers;

record structure, including memory and control means, connected to said interface structure for accessing a file and storing data relating to certain select ones of said individual callers in accordance with said calling number identification data;

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qualification structure controlled by said record structure for controlling access to said system by said individual callers; and

means for processing at least certain of said data developed by said terminals and said calling number identification data relating to certain select ones of said individual callers.

103. A system according to claim 96 for use with a communication facility having a capability (DNIS) to provide called number identification data to identify a called number form a plurality of different numbers for calling, and further including means for selecting a specific one of a plurality of formats of said interface structure.

104. A system according to claim 103, wherein said called number identifies a specific one of a plurality of operating formats for interface.

<u>'707 Patent,</u> Claim 117

96. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may *643 comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data wherein said communication facility has a capability to provide call data signals indicative of calling number identification data for at least certain of said individual callers, said analysis control system comprising:

interface structure coupled to said communication facility to interface each of said remote terminals for voice and digital communication, and including means to provide signals representative of data developed by said remote terminals and for receiving said calling number identification data;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers;

record structure, including memory and control means, connected to said interface structure for accessing a file and storing data relating to certain select ones of said individual callers in accordance with said calling number identification data;

qualification structure controlled by said record structure for controlling access to said system by said individual callers; and

means for processing at least certain of said data developed by said terminals and said calling number identification data relating to certain select ones of said individual callers. 115. A system according to claim 96, wherein said individual callers provide other data.

116. A system according to claim 115, wherein said individual callers provide caller credit card number data as said other data.

117. A system according to claim 116, wherein said individual callers provide expiration data for caller credit card number data.

<u>'707 Patent, Claim 192</u>

183. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said communication facility has a capability to provide calling number identification data, said analysis control system comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication and including means to receive caller data signals representative of data relating to said individual callers, including caller personal identification data and said calling number identification data provided automatically from said communication facility;

voice generator structure coupled through said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers and to prompt said individual callers to enter data;

record testing structure connected to receive and test said caller data signals including said calling number identification data and said caller personal identification data against previously stored calling number identification and caller personal identification data; and

analysis structure for receiving and processing said caller data signals under control of said record testing structure.

191. An analysis control system according to claim 183, wherein said communication facility automatically provides called number identification data (DNIS) to identify a select called number from a plurality of called numbers.

*644 192. An analysis control system according to claim 191, wherein said select called number (DNIS) identifies a select format from a plurality of distinct

operating formats.

'863 Patent, Claim 49

27. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication, and including means to provide caller data signals representative of data relating to said individuals callers developed by said remote terminals and including means to receive called number identification signals (DNIS) automatically provided by said communication facility to identify a select one of a plurality of different called numbers associated with a select format of a plurality of different formats;

record structure, including memory and control means, said record structure connected to receive said caller data signals from said interface structure for accessing a file and storing certain of said data developed by said remote terminals relating to certain select ones of said individual callers;

qualification structure coupled to said record structure for qualifying access by said individual callers to said select format based on at least two forms of distinct identification including callers customer number data and at least one other distinct identification data element consisting of personal identification data provided by a respective one of said individual callers; and

switching structure coupled to said interface structure for switching certain select ones of said individual callers at said remote terminals to any one of a plurality of live operators wherein said live operators can enter at least a portion of said caller data relating to said select ones of said individual callers through interface terminals, which is stored in said record structure.

49. An analysis control system according to claim 27, wherein an additional form of distinct identification is provided by said individuals callers on-line and is stored for subsequent use.

'863 Patent, Claim 50

50. A system according to claim 27, wherein said qualification structure further executes a test for unacceptable customer numbers based upon data

developed by said remote terminals indicative of said caller customer numbers.

27. (See above).

'863 Patent, Claim 65

65. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means, and digital input means in the form of an array of alphabetic numeric buttons for providing data, said analysis control system comprising:

an interface structure coupled to said communication facility to interface said remote terminals for voice and digital communication, and including means to provide caller data signals representative of data relating to said individual callers developed by said remote terminals and including means to automatically receive called number identification signals (DNIS) to identify a select format from a plurality of formats;

voice generator structure coupled through said interface structure for actuating said remote terminals as to *645 provide voice operating instructions to said individual callers;

record structure, including memory and control means, said record structure connected to receive said caller data signals from said interface structure for accessing a file and storing digital caller data relating to said individual callers provided from said digital input means through said interface structure; and

qualification structure for testing caller data signals provided by at least one of said individual callers to specify a consumable participation key, said consumable participation key for use during a single predetermined period of time for restricting the extent of access to at least a portion of said system by said one of said individual callers on the basis of entitlement.

'863 Patent, Claim 171

93. An analysis control system for use with a communication facility including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said communication facility has a capability to provide call data signals indicative of calling number identification data and called number

identification data for at least certain of said individual callers, said analysis control system comprising:

interface structure coupled to said communication facility to interface each of said remote terminals for voice and digital communication, and including means to provide signals representative of data developed by said remote terminals and for receiving said calling number identification data and said called number identification data (DNIS) to identify one from a plurality of called numbers; voice generator structure coupled though said interface structure for actuating said remote terminals as to provide vocal operating instructions to said individual callers;

record structure, including memory and control means, said record structure connected to said interface structure for accessing a file and storing data relating to certain select ones of said individual callers in accordance with said calling number identification data:

qualification structure controlled by said record structure for controlling access to said system by said individual callers; and

means for processing at least certain of said data developed by said remote terminals relating to certain select ones of said individual callers.

169. An analysis control system according to claim 93, wherein said data relating to certain select ones of said individual callers includes credit card number data.

171. An analysis control system according to claim 169, wherein said credit card number data is tested against unacceptable credit card numbers.

CLAIMS INVOLVING PRODUCTS CARRYING PARTICIPATION NUMBERS '707 Patent, Claim 44

37. A process for controlling operations of an interface with a telephonic communication system including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said telephonic communication system has a central capability to automatically provide call data signals, indicative of calling number identification data (DNIS) or both, said process including the steps of:

*646 providing products carrying participation numbers specifying limits on use to entitle individual callers to access said operations of the interface with said telephonic communication system;

receiving said call data signals indicative of called number identification data including a called number (DNIS) dialed by a respective one of said individual callers to select a specific operating format from a plurality of operating formats of said operations of the interface;

coupling said remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide vocal operating instructions to specific ones of said individual callers;

receiving digital identification data from said individual callers responsive to said voice signals including said participation numbers for said individuals callers and answer data developed by said remote terminals under control of said individuals callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface based on said limits on use specified by said participation numbers for said individual callers and accordingly providing approval signals for qualified individual callers;

conditionally accessing a memory with said participation numbers and storing data relating to calls from said individual callers;

processing at least certain of said answer data responsive to said approval signals; and

providing on-going accounting data to said individual callers at intervals during calls from said individual callers.

44. A process for controlling operations of an interface with a telephonic communication system according to claim 37, further comprising the step of: invalidating on-line said participation numbers after said limits on use specified by said participation numbers are reached.

<u>'707 Patent,</u> Claim 93

69. A process for controlling operations of an interface with a telephone communication system, said process including steps of:

providing products carrying participation numbers specifying limits on use to entitle individual callers to access said operations of the interface with said telephone communication system;

coupling remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide vocal operating (Cite as: 63 F.Supp.2d 583)

instructions to specific ones of said individual callers:

receiving digital identification data from said individual callers responsive to said voice signals including said participation numbers for said individual callers and answer data provided from said remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface based on said limits on use specified by said participation numbers for said individual callers and accordingly providing approval signals for qualified individual callers;

accessing a memory with said participation numbers for said individual callers and storing data relating to calls from said individual callers;

*647 processing at least certain of said answer data responsive to said approval signals.

93. A process for controlling operations of an interface with a telephone communication system according to claim 69, wherein said participation numbers are numbers coded for verification.

<u>'863 Patent,</u> Claim 79

79. A process for controlling operations of an interface with a telephonic communication system including remote terminals for individual callers, wherein each of said remote terminals may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing data and wherein said telephonic communications system has a capability to automatically provide call data signals indicative of calling number identification data or called number identification data (DNIS) or both, said process including the steps of:

providing products carrying concealed participation numbers specifying limits on use to entitle said individual callers to access said operations of the interface with said telephonic communications system;

receiving said call data signals indicative of called number identification data including a called number (DNIS) dialed by individual callers to select a specific operating format from a plurality of operating formats of said operations of the interface;

coupling remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide vocal operating instructions to specific ones of said individual callers:

receiving digital identification data from said individual callers responsive to said voice signals including said participation numbers and answer data provided from said remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface based on said limits on use specified by said participation numbers and accordingly approving qualified individual callers;

conditionally aborting interaction during said operations of the interface with an individual caller at an [sic] remote terminal and coupling said remote terminal to an interface terminal under predetermined conditions for direct personal communication;

accessing a memory with said participation numbers and storing data relating to calls from said individual callers; and

processing at least certain of said answer data responsive to approving said qualified individual callers.

'863 Patent, Claim 190

188. A process for controlling operations of an interface with a telephone communications system, said process including the steps of:

providing products carrying key numbers for participation specifying limits on use to entitle individual callers to access said operations of the interface with said telephone communications system;

coupling remote terminals to said interface for providing voice signals to said individual callers and generating said voice signals for actuating said remote terminals as to provide voice operating instructions to specific ones of said individual callers;

receiving digital identification data from said individual callers responsive to said voice signals including said key numbers for said individual callers and answer data provided from said *648 remote terminals under control of said individual callers;

qualifying said individual callers by testing to determine if said individual callers are entitled to access said operations of the interface based on said limits on use specified by said key numbers for said individual callers and accordingly providing approval signals for qualified callers;

accessing a memory with said key numbers for said individual callers and storing data relating to calls

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from said individual callers; and providing certain of said voice signals to said individual callers to indicate computer generated number data formed during operations of the interface.

189. A process according to claim 188, wherein said computer generated number data is stored in said memory.

190. A process according to claim 189 wherein said computer generated number data is stored in association with said digital identification data.

CONDITIONAL FORMAT CLAIMS '150 Patent, Claim 15

10. A process for interfacing a telephonic communication system including remote terminals with a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least one of said formats having at least one condition for a calling terminal, and wherein said telephonic communication system provides call data signals, as to indicate called and calling numbers, said process including the steps of:

receiving said call data signals from said telephonic communication system for a calling remote

terminal;

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selecting a processing format of said multiple port, multiple format processing system for the calling remote terminal under control of said data signals as the selected format;

testing the selected format in relation to said call data signals; and

conditionally interfacing said selected format to a calling terminal under control of said testing of call data signals.

- 11. A process according to claim 10 further including the step of fetching control data addressable with said call data for use in the step of testing.
- 15. A process according to claim 11 wherein said step of fetching control data includes fetching data to specify demographic conditions.

'285 Patent, Claim 17

17. A process for interfacing (1) a telephonic communication system including remote terminals either with (2) a multiple port, multiple format data processing system, said multiple port, multiple

format data processing system for concurrently processing data from said remote terminals according to a plurality of formats at least one of said formats at lease one condition for a calling terminal, or (3) one of a plurality of operator stations with prompting capability for a plurality of formats, and wherein said telephonic communications system provides call data signals, as to indicate called and calling numbers, said process including the steps of:

receiving said call data signals from said telephonic communications system for a calling remote terminal indicative of DNIS and ANI automatically provided by said telephonic communications system:

selecting a processing format either for said multiple port, multiple format processing system or one of said plurality of operator stations for the calling remote terminal under control of said data signals as the selected format;

testing the selected format in relation to said call data signals; and

*649 conditionally interfacing said calling terminal to said multiple port, multiple format data processing system for execution of said selected format or to one of said plurality of operator stations under control of said testing of call data signals.

<u>'285 Patent,</u> Claim 20

20. A method for interfacing (1) a telephonic communications system including individual remote calling terminals for individual callers with (2) a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least of one said formats having at least one specified condition for said remote terminals calling to interface said data processing system, and (3) a plurality of live operator attended terminals and wherein said telephonic communication system includes the capability of providing call data signals, said method comprising the steps of:

receiving said call data signals from said telephonic communications system for said remote terminals calling to interface said data processing system including DNIS automatically provided by said telephonic communication system;

selecting for said remote terminals a select processing format from said plurality of formats of said multiple port, multiple format data processing system under control of said call data signals including DNIS provided by said telephonic communications system;

testing said select processing format in relation to

said call data signals;

conditionally interfacing said selected processing format to said remote terminals selectively terminating certain select calls from said remote terminals in favor of said operator attended terminals; and

transferring substantially all of said certain select calls from said operator attended terminals back to said multiple port, multiple format data processing system.

'285 Patent, Claim 24

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19. A method for interfacing (1) a telephonic communications system including individual remote calling terminals for individual callers with (2) a multiple port, multiple format data processing system, said multiple port, multiple format data processing system for concurrently processing data from said remote terminals according to a plurality of formats, at least of one said formats having at least one imposed condition for said remote terminals calling to interface said data processing system and wherein said telephonic communication system includes the capability of providing call data signals, said method comprising the steps of:

receiving said call data signals from said telephonic communications system for said remote terminals calling to interface said data processing system including DNIS automatically provided by said telephonic communication system;

selecting for said remote terminals a select processing format from said plurality of formats of said multiple port, multiple format data processing system under control of said call data signals including DNIS provided by said telephonic communications system;

testing said select processing format in relation to said call data signals;

conditionally interfacing said select processing format to said remote terminals under control of said testing in relation to said call data signals; and selectively terminating certain select calls from said remote terminals in favor of said operator attended terminals.

*650 22. A method for interfacing a telephonic communications system according to claim 19, further comprising the step of:

providing signal-represented call data from said remote terminals including calling numbers as additional call data signals.

24. a method for interfacing a telephonic communications system according to claim 22,

further comprising the steps of:

storing a record of negative file data, said select processing format using said additional call data signals to access said record and obtain data to specify and test for negative file conditions; and terminating calls from said remote terminals if said calling number matches said data obtained from said negative file data.

'285 Patent, Claim 77

65. An interface control system for use with, (1) a communication facility including remote terminals for individual callers to make calls, wherein said remote terminals may comprise a conventional telephone instrument including voice communication means and some of said remote terminals may further comprise digital input means for providing data, and (2) a multiple port, multiple format processor for concurrently processing data from a substantial number of callers in any of a plurality of formats, said communication facility automatically provides call data signals, as to indicate called data (DNIS), to select a particular format from said plurality of formats, and (3) a plurality of live operator attended terminals with prompting capability, for a plurality of formats, said interface control system comprising:

interface means for providing automated voice messages relating to a specific format to certain of said individual callers, wherein said certain of said individual callers digitally enter data through said digital input means;

means for directly forwarding a call coupled to said interface means for forwarding a call from any one of said remote terminals to one of said plurality of live operator attended terminals under control of said call data signals when said remote terminals do not have the capability to digitally provide data; means for processing coupled to said live operator attended terminals for processing caller information data entered by an operator at said live operator attended terminal; and

means for storing coupled to said interface means and said processing means for storing certain select data from said caller information data entered by said operator and data entered digitally by said individual callers.

77. An interface control system according to claim 65, wherein at least one of said plurality of formats has at least one imposed condition for said remote terminals calling to interface said interface control system.

'984 PATENT CLAIMS
'984 Patent, Claim 4

comprising:

1. A telephone call processing system for receiving calls from a multitude of terminals in different call modes including an "800" call mode and a "900" call mode for processing to an interface format and involving digital signals associated with said terminals as for identification or data, said system

first response unit means for receiving calls in said "800" call mode:

qualification means for qualifying said calls in said "800" call mode received by said first response unit to provide qualified calls:

second response unit means for receiving calls in a second call mode;

means for processing calls in an interface format; and

*651 means for coupling said qualified calls and said calls in a second mode to said means for processing.

4. A system according to claim 1 wherein said qualification means comprises means for testing said digital signals associated with said terminals originating said calls.

'984 Patent, Claim 15

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15. A telephone interface system for individually interfacing callers at a multitude o[f] remote terminals for voice-digital communication through a telephone communication facility, said system comprising:

communication means for establishing telephone communication with currently active callers at certain of said terminals through said telephone communication facility;

means for providing identification signals to said communication means indicative of said currently active callers, said means for providing identification signals comprising means for providing at least a portion of the digits associated with a remote terminal for identification;

memory means for storing caller cues and use indications for said caller cues in relation to said callers as identified by said identification signals; cue means for receiving said caller cues to provide voice signals through said communications means to prompt responses from said currently active of said callers in the form of digital data signals; and means for selecting a current caller cue from said memory means for one of said currently active callers for application to said cue means under control of said identification signals for said one of said currently active callers and said use indications in said memory means for said one of

said currently active callers.

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END OF DOCUMENT

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Only the Westlaw citation is currently available.

This case was not selected for publication in the Federal Reporter.

NOTE: Pursuant to Fed.Cir.R. 47.6, this order is not citable as precedent. It is public record.

Please use FIND to look at the applicable circuit court rule before citing this opinion. Federal Circuit Rule 47.6. (FIND CTAF Rule 47.6.)

United States Court of Appeals, Federal Circuit.

MARLOW INDUSTRIES, INC., Plaintiff-Appellant, v.
IGLOO PRODUCTS CORP., Defendant-Appellee.

No. 02-1386.

May 23, 2003.

Before LOURIE, LINN, and PROST, Circuit Judges.

PROST, Circuit Judge.

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*1 Marlow Industries, Inc. ("Marlow") appeals from the decision of the United States District Court for the Northern District of Texas granting summary judgment to Igloo Products Corp. and holding Marlow's United States Patent No. 4,726,193 ("the '193 patent"), as amended by Reexamination Certificate B1 4,726,193 ("the first reexamination") and Reexamination Certificate U.S. 4,726,193 C2 ("the final reexamination") unenforceable due to Marlow's inequitable conduct before the United States Patent and Trademark Office ("PTO"). Marlow Indus., Inc. v. Igloo Prods. Corp., No. 396-CV-2688-P. 2002 WL 485698 (N.D.Tex. Mar. 28, 2002). Because the district court did not commit error in granting Igloo's motion for summary judgment, we affirm the judgment.

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The '193 patent covers picnic boxes. Independent claim 1 reads in pertinent part "[a] refrigerator/food warmer picnic box apparatus or the like comprising ... means ... for selectively heating and cooling and

circulating the air in the food compartment picnic box" (emphasis added). Marlow filed an infringement action against Igloo in September 1996 and cross-moved for partial summary judgment on September 29, 1997, claiming that, as a matter of law; several of the contested picnic boxes infringed the patent.

In an opinion dated April 3, 1998, the district court concluded, "it is obvious that the plain meaning of Claim 1 requires that the picnic box be capable of both 'heating and cooling." 'Both parties moved the court to reconsider its April 3 order. On September 1, 1998, the district court entered an order denying Marlow's motion for reconsideration, but granting Igloo's motion in part by vacating its prior ruling that some of the accused picnic boxes literally infringed the '193 patent, concluding rather that none of the accused products literally infringed the patent. The court left open several issues regarding infringement under the doctrine of equivalents.

In June 1998, Igloo requested the PTO to reexamine the '193 patent to consider prior art that was not previously considered. Marlow subsequently moved to stay further action in the district court until completion of the reexamination proceedings. Igloo's request for the final reexamination brought to the examiner's, attention the pending infringement litigation in the district court between Marlow and Igloo, and included a copy of Marlow's brief in support of its September 29, 1997, motion for partial summary judgment. During the reexamination, Marlow attempted to amend the patent by adding claims 4 and 5. These claims included language that covers a picnic box, which "cools or heats" (independent claim 4) and which "only cools" (claim 5, depending from claim 4). The examiner rejected these claims pursuant to 35 U.S.C. § 305, which prohibits expanding the scope of the claimed invention during a reexamination.

Marlow then attempted for a second time to amend the patent by adding claims 6 and 7. These claims, both depending from claim 1, included language covering a picnic box, which "heats and circulates only warm air" (claim 6) and which "cools and only circulates cooled air" (claim 7). The examiner again rejected these claims as an attempt to impermissibly broaden the scope of the original patent. Marlow appealed the examiner's rejection of its claims, including the rejection of its four proposed amendments, to the Board of Patent Appeals and Interferences ("Board"). The Board affirmed the examiner's rejection of proposed claims 5-7. However, the Board reversed the examiner's rejection

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of claim 4 on the basis that it, like preexisting claim 1, includes the "selectively heating and cooling" language and, thus, cannot be construed as enlarging the scope of the claimed invention.

*2 In August 2001, Igloo moved for summary judgment in the district court, in which the infringement action was pending, alleging that Marlow had committed inequitable conduct by failing to disclose to the examiner during the final; reexamination of the '193 patent the court's prior claim construction of that patent. The district court determined that Marlow had failed during the reexamination to provide the examiner with the court's April 3 and September 1, 1998 orders, that these orders were material to the reexamination proceeding, and that Marlow knew or should have known that a patent examiner would have found such information material. The district court also found that Marlow failed to submit to the examiner its motion for reconsideration of the court's April 3 order, but the court did not analyze Marlow's inequitable conduct with regard to its failure to submit this document. Based upon these findings, the court concluded that Marlow engaged in inequitable conduct before the PTO. The district court therefore granted Igloo's motion for summary judgment and declared all claims of the '193 patent unenforceable.

Marlow filed a timely appeal and we have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

II

We review the district court's grant of summary judgment de novo, with all justifiable factual inferences being drawn in favor of the party opposing the motion. See Anderson v. Liberty Lobby, Inc. 477 U.S. 242, 255 (1986). Summary judgment is appropriate where there is no genuine issue of material fact and the moving party is entitled to judgment as a matter of law. See Fed.R.Civ.P. 56(c). Under Anderson, whether a given factual dispute requires submission to a jury must be guided by the substantive evidentiary standards that apply to the case. 477 U.S. at 255. It is the substantive law's identification of which facts are critical and which facts are irrelevant that governs whether a genuine issue of material fact exists. Id. at 247-48.

It is well settled that patent applicants are required to prosecute patent applications "with candor, good faith, and honesty." <u>Molins PLC v Textron. Inc.</u>, 48 F.3d 1172, 1178, 33 USPQ2d 1823, 1826 (Fed.Cir.1995). This duty likewise applies to reexamination proceedings. 37 C.F.R. § 1.555

(2002). A breach of this duty can take several forms, including the failure to disclose material information. *Molins*, 48 F.3d at 1178, 33 USPQ2d at 1826. Further, a breach of this duty, when coupled with an intent to deceive or mislead the PTO, constitutes inequitable conduct, which, when proven, renders the patent unenforceable. *Id.* at 1178, 33 USPQ2d at 1827.

To establish Marlow's inequitable conduct, Igloo must show by "clear and convincing evidence" that Marlow failed to disclose material information with intent to deceive the PTO. Kingsdown Med Consultants, Ltd. v. Hollister, Inc., 863 F.2d 867, 872. 9 USPQ2d 1384, 1389 (Fed.Cir.1988); FMC Corp v. Manitowoc Co., 835 F.2d 1411, 1415, 5 USPO2d 1112, 1115 (Fed.Cir.1987). Once the materiality of the information and Marlow's intent to mislead have been established, the district court must "weigh them to determine whether the equities warrant a conclusion that inequitable conduct occurred." Molins, 48 F.3d at 1178, 33 USPQ2d at 1827. Moreover, when balanced against high materiality, the showing of intent can be proportionally less. Brasseler, U.S.A. I. L.P. v. Stryker Sales Corp., 267 F.3d 1370, 1381, 60 USPQ2d 1482, 1488 (Fed.Cir.2001).

*3 On appeal, Marlow maintains that the district court erred in granting summary judgment to Igloo because it raised genuine issues of material fact. According to Marlow, the district court impermissibly weighed the evidence regarding its failure to disclose information to the PTO, the materiality of the allegedly withheld information, and Marlow's intent to deceive the PTO. Igloo counters that Marlow has no additional evidence to offer that would warrant changing the district court's determination or that would otherwise merit further proceedings. After drawing all justifiable inferences in favor of Marlow, we conclude that there are no genuine issues of material fact with regard to Marlow's inequitable conduct and Igloo is entitled to judgment as a matter of law.

Α

Marlow first argues that a genuine issue of material fact exists with regard to whether it withheld any information relating to the district court action from the PTO during the final reexamination. In this regard, Marlow notes that it advised the examiner that the '193 patent was the subject of an infringement action pending before the district court, the examiner was provided with copies of the particular documents relating to those proceedings

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which Igloo believed relevant to the final reexamination, and the entire record was made available to the examiner by Marlow's and Igloo's disclosures.

Igloo maintains that Marlow never once apprised the examiner of the substance of the district court's claim construction of the '193 patent or even of the fact that the court had construed the patent. Igloo specifically contends that the district court correctly found that Marlow failed to submit the three disputed documents to the examiner.

The district court did not err in concluding that there was no genuine issue of material fact with respect to Marlow's failure to submit copies of the disputed documents to the examiner during the final reexamination. In its responses to Igloo's Requests for Admission Nos. 92-94, Marlow admitted that at the time of the issuance of the final reexamination. the file wrapper did not include copies of these documents. We reject Marlow's argument that a genuine issue of material fact exists as to whether it withheld any information relating to the infringement action from the PTO. Informing the examiner of the pending infringement action is not commensurate with bringing to the examiner's attention the district court's prior claim construction of the patent or disclosing the court orders embodying this construction. See Rohm & Huas Co. v. Crystal Chem. Co., 722 F.2d 1556, 1572-73, 220 USPQ 289, 302 (Fed.Cir.1983) (concluding that a presumption that an examiner was able to find, with his expertise and adequate time, the critical data when he was presented with a "mountain of largely irrelevant data" ignores the real world conditions under which examiners work). Moreover, the only document from the infringement litigation submitted to the examiner was Marlow's motion for partial summary judgment filed on September 25, 1997, which was included as an exhibit to Igloo's request for reexamination. This document, however, was filed in the district court more than six months prior to the court's initial construction of the '193 patent and, thus, had no bearing on the scope of the claims at issue during the reexamination proceedings.

В

*4 Marlow next argues that a genuine issue of material fact exists with regard to the materiality of the district court's claim construction orders. "Materiality is not limited to prior art but embraces any information that a reasonable examiner would be substantially likely to consider important in deciding whether to allow an application to issue as a patent."

GFI. Inc. v. Franklin Corp., 265 F.3d 1268, 1273; 60 USPQ2d 1141, 1143 (Fed.Cir.2001) (emphasis in original); 37 C.F.R. § 1.56(b) (2002).

Marlow contends that in reaching its finding that its previous orders were material to the examiner's final reexamination of the '193 patent, the district court erroneously assumed that: (1) the construction of claim 1, and thus claim 4, applied by the Board was in conflict with the district court's construction of claim 1; and (2) Marlow was attempting during the reexamination to avoid the district court's requirement that to infringe the '193 patent an accused device had to be capable of both heating and cooling. According to Marlow, it argued to the examiner that claim 1 could not require both "simultaneous" heating and cooling because that would be physically impossible, which is not inconsistent with the district court's interpretation of the claim.

Igloo responds that the district court correctly concluded that the disputed documents were material to the final reexamination because: (1) they bore directly on the scope of the claims that Marlow attempted to amend; and (2) Marlow's interpretation of the patent asserted before the examiner was inconsistent with the district court's construction of the patent and Marlow's acquiescence to that construction.

The district court did not err in concluding that there was no genuine issue of material fact with respect to the materiality of the April 3 and September 1, 1998. orders to the final reexamination from the standpoint of a reasonable examiner reviewing Marlow's proposed amendments. Faced with Marlow's attempts to amend claim language in the '193 patent, the examiner had to first construe the scope of the claims, including the specific language covering picnic boxes that are capable of both "heating and cooling," to determine whether the proposed "cools or heats" language would impermissibly enlarge the scope of the patent. See 35 U.S.C. § 305(a) (2002). In addition, the district court's two previous orders construing the '193 patent and concluding that picnic boxes that only cooled did not infringe the patent were binding on the examiner under the doctrine of issue preclusion. See <u>In re Freeman</u>. 30 F.3d 1459, 1466-69, 31 USPQ2d 1444, 1448-51 (Fed.Cir.1994) (concluding that the Board was bound by the district court's prior interpretation of the reissue claims under the doctrine of issue preclusion). Thus, a reasonable examiner would have been substantially likely to consider these two orders important in deciding whether to allow the amendments to issue.

*5 Moreover, contrary to Marlow's assertion, whether or not the Board, applying the same construction of claim 1 as the district court, found claim 4 equivalent in scope to claim 1 is irrelevant to the materiality inquiry. This court has articulated the materiality criterion as follows:

[T]he standard to be applied in determining whether a reference is "material" is not whether the particular examiner of the application at issue considered the reference to be important; rather, it is that of a "reasonable examiner." Nor is a reference immaterial simply because the claims are eventually deemed by an examiner to be patentable thereover.

Molins, 48 F.3d at 1179, 33 USPQ2d at 1828 (citation omitted); Perseptive Biosystems, Inc. v. Pharmacia Biotech, Inc., 225 F.3d 1315, 1322, 56 USPQ2d 1001, 1006 (Fed.Cir.2000) (stating that a patent may be valid and yet be rendered unenforceable due to inequitable conduct). Thus, that the Board's interpretation of the '193 patent may have been consistent with the district court's previous construction does not eviscerate the materiality of the previous orders from the viewpoint of a reasonable examiner in the first instance. Here, a reasonable examiner reviewing Marlow's proposed amendments would have considered the district court's prior construction of that patent important.

C

Lastly, Marlow argues that a genuine issue of material fact exists with regard to Marlow's intent to deceive the PTO. Intent to mislead does not require direct evidence, and is typically inferred from the facts. GFI, 265 F.3d at 1274, 60 USPQ2d at 1144. Intent may be inferred when a patent applicant knew, or should have known, that withheld information could be material to the PTO's consideration of the patent application. Critikon, Inc. v. Becton Dickinson Vascular Access, Inc., 120 F.3d 1253, 1256-57, 43 USPQ2d 1666, 1668-69 (Fed.Cir.1997); Brasseler, 267 F.3d at 1375-76, 60 USPQ2d at 1484; Merck & Co. v. Danbury Pharmacal, Inc., 873 F .2d 1418, 1422, 10 USPQ2d 1682, 1686 (Fed.Cir.1989) (stating that intent is most often proven by a showing of acts the natural consequences of which are presumably intended by the actor).

Marlow argues that a factual dispute exists with regard to its alleged intent to deceive the PTO. According to Marlow, the district court found intent by incorrectly assuming that claim 4 is broader than claim 1 and by disregarding the affidavit of Marlow's attorney denying an intent to deceive.

Igloo argues that the district court correctly concluded that Marlow acted with intent to deceive the PTO. According to Igloo, Marlow knew, or should have known that the examiner would have considered the district court's claim construction of the '193 patent (specifically its holding that cool only or heat only devices cannot infringe the '193 patent) material to Marlow's attempts to add claims directed to cool only or heat only devices. Igloo further contends that the affidavit of Marlow's counsel does not create a genuine issue of fact as to Marlow's intent because it consists of mere denials of an intent to deceive.

*6 The district court did not err in concluding that there was no genuine issue of material fact with respect to Marlow's intent to deceive the PTO by failing to submit the district court's prior orders construing the claims of the '193 patent when it proposed amended language during the final reexamination. The same attorney represented Marlow before the district court in this case and before the PTO during the final reexamination proceedings. See Critikon, 120 F.3d at 1257, 43 USPQ2d at 1669 (noting that the patent counsel who were handling the reissue proceedings were keenly aware of the ongoing district court litigation and the issues involved prior to the resolution of the reissue proceedings). Yet, despite the district court's prior holding that a picnic box had to both heat and cool to infringe the 193 patent, Marlow proposed claims using the disjunctive language of "cools or heats." See In re Freeman, 30 F.3d at 1465, 31 USPQ2d at 1448 (stating that "given the interpretation of the district court during the infringement litigation, it is clear that the amendments to the independent claims during reexamination attempt[ed] an end run around the [district court's] interpretation"). Under these circumstances and in light of the binding nature of the district court's prior claim construction, Marlow's failure to submit the April 3 and September 1, 1998, orders leads to a finding that Marlow intended to deceive the PTO. As the district court recognized when considering Igloo's inequitable conduct motion, Marlow should have known that a patent examiner would have found the two prior court orders considering the construction of the '193 patent material to the reexamination. Indeed, during the pendency of the reexamination, Igloo's counsel twice reminded Marlow by letter of its duty to disclose the district court's claim construction to the examiner. The only evidence Marlow offers to negate a finding of an intent to deceive is an affidavit from its counsel denying such deceitful intent. However, a mere denial of an intent to deceive is not sufficient where a

patentee faces a high level of materiality and proof that it knows or should have known of that materiality. Critikon, 120 F.3d at 1257, 43 USPQ2d at 1669 (citing FMC Corp ., 835 F.2d at 1415, 5 USPQ2d at 1116).

CONCLUSION

In sum, we conclude that viewing the evidence in the light most favorable to Marlow, there is no genuine issue of material fact as to the materiality of the district court's April 3 and September 1, 1998, orders to the final reexamination of the '193 patent and Marlow's intent to deceive the PTO. Furthermore, the district court did not abuse its discretion in holding the '193 patent unenforceable. Accordingly, we affirm the district court's order granting summary judgment of invalidity to Igloo.

2003 WL 21212626 (Fed.Cir.)